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ABSTRACT

This document provides an overview of Peace Corps water and sanitation activities, five case studies (Thailand, Yemen, Paraguay, Sierra Leone, and Togo), programming guidelines, and training information. Each case study includes: (1) background information on the country's geography, population, and economics; (2) information on the country's water and sanitation status; (3) an overview of Peace Corps water and sanitation projects in the country, including the history of such projects; (4) information related to such areas as training, collaboration, community participation, and women in development; and (5) an analysis pointing out aspects which contributed to or hindered success of the projects. The training information provided includes lists of preservice and inservice skill-training objectives and sources of technical training and assistance resources and materials. A list of all Peace Corps water and sanitation activities since 1970 by region and country, the survey questionnaire used to gather data for the case studies, and information on project planning are among the items included in appendices. (JN)

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PEACE CORPS
WATER/SANITATION
CASE STUDIES AND ANALYSES

Compiled by

DIANA E. TALBERT

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Case Study Number 4
January 1984

PEACE CORPS WATER/SANITATION CASE STUDIES AND ANALYSES
January 1984

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Western Samoa, Group I (1967), Environmental Sanitation. About eight to ten PCVs were village level introducers and promoters of the (Philippines) pour flush water seal toilet. Previous to the "Peace Corps" toilet, excreta disposal was through the over-the-lagoon "benjo."

These early Volunteers could not have known how successful they were. For years after their first appearance, "PC toilets" were the butt of jokes and the surrounding latrine shed was more often than not used as a storage area. Then about ten years later attitudes began to change. Thanks in great measure to continued support by the local public health division, most villages have banned the unsanitary "benjo" and the water seal rural penetration rate is estimated to be 70 percent of Samoan homes.

Today, if you ask the man/woman on the street as to what has been PC's greatest contribution to the development of Western Samoa, he/she will give one of two answers: "They educated my kids" or "They gave Samoans sanitary toilets."

Acting Peace Corps Country Director in Western Samoa
December 1982

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INTRODUCTION

PURPOSE

Water and sanitation activities are the subject of this, the latest in a series of case studies by the Information Collection and Exchange. This document provides a record of Peace Corps water and sanitation experiences from 1970 to the present, and provides Peace Corps programmers with information which may assist them in starting new programs or refining existing ones. This document includes an overview of the activities of the Peace Corps Water/Sanitation Sector, five case studies, an analysis of each case study to identify aspects contributing to success or failure of projects, water/sanitation-specific programming and project planning guidelines, and training information.

According to the UN Environment Program, the primary objective of Third World development is the improvement of the quality of life for the vast majority of the world's populations who are underprivileged. For these people, the improvement of life quality means, literally, the provision of the most basic needs--water, food, clothing, shelter, health, environment, education, and income. Of these, water has received special attention in the 1980s in the programs of the United Nations International Drinking Water Supply and Sanitation Decade.

During the 1970s, Peace Corps programming guidelines based on basic human needs and building the capacity for self-help led to Volunteer activities which provided access to potable water, improved environmental sanitation, improved nutrition (as a consequence of irrigation practices), and provided health education related to water supply and sanitation.

Thus, all of the projects researched for this document reflect the criteria set as programming guidelines for meeting the needs of the poorest of the poor in the 1970s.

- Project activities were integrated with broader development program goals.
- Communities had expressed awareness of their development problems.
- Project participants were from the poor majority most in need of assistance, particularly women.
- Project materials and human resources were mostly local.
- Technologies were appropriate to the community.
- Project beneficiaries were trained in self-supporting and problem-solving skills.

In the 1980s, Peace Corps continues to engage qualified Volunteers in development projects which address the locally identified needs of host country people, especially those living in the poorest areas. The Peace Corps

Forward Plan for 1983-85 (November, 1982) builds on the previous decade's goals with initiatives that also emphasize income-generation and self-sustaining productive capacity. The case studies documented in this report are particularly relevant to the Forward Plan initiatives which aim to:

- increase the impact of Peace Corps programs by emphasizing program methods, organization, staffing, relationships, and procedures which will be most efficient and/or have the greatest multiplier effect;
- emphasize Volunteer assignments which promote local economic development and self-sustaining productive capacity (especially in areas of food and energy), develop income-generating market mechanisms, and build local institutions and initiative;
- develop an effective and efficient training and selection strategy for both staff and Volunteers in light of existing resources;
- increase public awareness of the Peace Corps through coordinated communications programs focused on the activities of the Volunteers and returned Volunteers to enhance recruitment; to support the accomplishment of legislative goals and other Forward Plan Initiatives; and to broaden public understanding of the support for Volunteers by other organizations; and
- expand mutually beneficial relationships, including joint programs, with public and private sector organizations (including international organizations) in the United States and in developing countries.

METHODOLOGY

There were three phases in the preparation of this document: Phase I, a survey of Peace Corps water/sanitation activities from 1970 through 1982; Phase II, identification of ten countries with the potential for case study; and Phase III, the selection of and research on five countries for the preparation of indepth narrative and case study analyses.

The process of gathering information on Peace Corps water/sanitation activities was a formidable one for three principal reasons. First, the document covers Peace Corps activities in more than 50 countries since 1970. Much of this data was difficult to obtain. Second, water/sanitation activities were not usually designated as such by project; rather they were often components of projects in the sectors of health, agriculture, municipal works, rural infrastructure, natural resource conservation, or community development. Third, project identification numbers, in most cases, changed every year.

Sources of information for Phase I included cables to the field requesting data; interviews with Country Desk Officers/Assistants in Washington; and review of the Country Desk Unit files and Country Management Plans (CMPs), Peace Corps archives, the Office of Training and Program Support (OTPS) files, the ICE Resource Center, the Peace Corps Library, and the Office of Volunteer Services Computer Center. In this primary activity, over 200 projects with water/sanitation activities were identified. (See Appendix B.)

Phase II, identification of ten countries with potential for the development of an indepth narrative as a case study, was based on the data collected in Phase I. Countries were selected to represent the three Peace Corps regions, different cultures, and different geographical features; projects in the countries were to provide experiences (either successful or unsuccessful) useful for programming; and a sufficient data base had to be accessible for each country.

Phase III case study countries were selected in consultation with the Water/Sanitation Sector Specialist, Information Collection and Exchange Coordinator and Project Manager, and Chiefs of Operations of the Regional Bureaus/Washington. Countries chosen for representation were Thailand and Yemen from the NANEAP Region, Sierra Leone and Togo from the Africa Region, and Paraguay from the Inter-America Region.

Detailed information for the case study narratives was gathered from the same sources used in Phase I with the addition of interviews with former Volunteers, staff, and Washington personnel including Regional Bureau Chiefs of Operations, Programming and Training Officers, and staff of the Office of Recruitment and Placement and the Office of Planning, Assessment, and Management Information. In addition, questionnaires were sent to former Volunteers and staff. Field offices sent documents and, in some cases, personal narratives. The Regional Training Resource Office in Lome, Togo, also supplied information. Unfortunately, time did not allow contacting all those who had information to contribute to these case studies.

Because the depth and breadth of available information varied from case study to case study, the history of activities in each country is traced to varying degrees.

The written resources upon which this document is based are mostly fugitive literature from project plans, Country Management Plans (CMPs), Trainee Assignment Criteria (TACs), letters of correspondence, and memoranda. However, the reference section lists resources for information. Citations in the text are by author's name when known. Otherwise, the document title is cited.

All the information in this document is compiled from these sources, except for the case study analyses and the programming guidelines. Joseph A. Gadek, an environmental and civil engineer consultant, wrote the programming guidelines and contributed to the analyses. Mr. Gadek was a "water PCV" in Nepal and a supervisory water resources engineer in the USAID-funded Arusha Planning and Village Development Project in Tanzania.

PRESENTATION

The Water/Sanitation Case Studies Background reviews Peace Corps activities and involvement across sectors since 1970. The background describes various Volunteer roles and their results, and analyzes state-of-the-art projects. The background presents issues which affect water and sanitation programming; for example, the relevance of an integrated water, nutrition, and health approach; the importance of the involvement of women and health education; and Peace Corps/Washington's support role.

Each case study is organized to provide:

- a country background of the geography, population, government, and economics, including an overview of the water/sanitation status of the country or of the sector involving Peace Corps water/sanitation programming;
- an overview of the country's Peace Corps' projects with a time line for easy reference to significant events covered in the case study;
- the history of water and sanitation activities presented by programming sector;
- a country-specific Peace Corps description, including (when available) descriptions of issues such as training, collaboration, and women in development; and
- an analysis of the case study pointing out aspects which contributed to or hindered success of projects.

Programming Guidelines follow the Case Studies. These guidelines reflect lessons learned in the case histories as well as Peace Corps' integrated approach to development assistance. The guideline section also contains information on how to develop a project plan. The next section describes training resources, including pre-service (PST) and in-service training (IST) skill-training objectives, available materials and workshops, and sources of technical training assistance.

The appendices provide an overview of all Peace Corps water/sanitation activities since 1970. The glossary at the end of the document lists acronyms used in the case studies.

PEACE CORPS WATER AND SANITATION SECTOR BACKGROUND

During the last 20 years, Peace Corps has assigned over 4,000 Volunteers to work in water supply and environmental sanitation projects throughout the developing world. Over 200 Peace Corps projects with water and/or sanitation as primary activities have been identified for the period from 1970 to the present. This history of projects integrating water or sanitation activities demonstrates Peace Corps' performance in meeting the needs of the poor and improving quality of life through:

- provision of clean water supplies to reduce morbidity and mortality;
- provision of water supplies where there were none before;
- development of small-scale enterprise opportunities;
- use of irrigation to improve food production and provide year-round domestic water supplies;
- institution building; and
- prevention of water-related diseases through health education.

Many Peace Corps projects have had a water supply or sanitation component as a primary activity although they may have been classified as agriculture, health, rural infrastructure, municipal works, natural resource conservation, or community development projects. (Water activities related to the fisheries sector were not included in this research.) Water and sanitation are probably the most common threads through the various sectors, the most binding elements in an integrated approach to development. This is particularly noteworthy considering the 200 projects do not include all the Peace Corps teachers, community development workers, agriculturalists, and engineers who worked outside their primary "project" area to construct wells, latrines, pumps, and irrigation systems, or to teach sanitation and prevention of water-related diseases such as malaria, onchocerciasis, and schistosomiasis (bilharzia).

This sustained effort by Peace Corps over the years has trained and educated coworkers and villagers, created employment opportunities, developed villager self-help skills, created income-generating opportunities, and saved for other productive uses that time and energy which had been spent fetching water from distant sources. (Peace Corps' Water and Sanitation Sector, 1981, p. 1.) In addition, Peace Corps efforts have produced numerous technical materials, publications, and manuals on water/sanitation which have had a wide impact on development.

The Job

Volunteers are assigned to a wide variety of water and sanitation projects in collaboration with host country ministries, voluntary agencies, and international development agencies. The Volunteers serve as water engineers, technicians, drillers, construction supervisors, irrigation specialists, health educators, and community organizers. They design and build water facilities and train counterparts to build water systems, wells, protected springs, distribution networks, storage tanks, and a wide variety of appropriate technology water devices. There are abundant examples of improved wells, springs, dams, catchments, water systems, appropriate water pumping devices (handpumps, hydraulic rams, windmills), and latrines maintained by local people that are the result of Peace Corps Volunteer involvement. The work has gained recognition from heads of state, government officials, and international development agencies.

As inspectors, community health workers, educators, and community organizers for sanitation projects, Volunteers organize village health committees; coordinate community latrine, garbage collection, and water source improvement projects; educate villagers; and strengthen public health extension networks.

Volunteer Numbers

Perhaps because of increased awareness regarding the importance of water and sanitation needs since the declaration of the UN International Drinking Water Supply and Sanitation Decade, requests for Volunteers in this sector have been on the increase since 1978; however, exact figures are available only since 1980. In December 1980, a Peace Corps survey revealed 334 Volunteers working in water supply and sanitation projects, with the largest number serving in Africa. A year later, the total number of Volunteers in water and sanitation projects had increased to 350, with a 51 percent increase in Africa. At the writing of this report, figures for 1982 were incomplete, but indications based on requests from countries, data on current training programs, and information contained in the Supply/Demand Survey were that the total number of Volunteers would not be lower than 350 and could be higher than 400.

The number of projects increased from 46 in 1980 to 51 in 1981. However, the increase in projects and water/sanitation Volunteers took place at the same time that total Volunteers in service overseas declined from 5,400 in 1980 to 5,100 in 1981. Analysis of the *1980-81 Volunteer Activity Survey Reports** suggests that almost 20 percent of all Volunteers--more than 1,100--were involved in water supply and sanitation projects as primary, secondary, or tertiary activities in 1980.

The Supply/Demand Survey of 1982, a Peace Corps/Washington field survey of anticipated needs for Volunteers by sector, was conducted by the Office of Training and Program Support (OTPS) to collect information on major trends for future programming. The data are to be used to define Peace Corps policy in recruitment, programming, and training assistance, as well as budgetary allocations. Preliminary results of this survey, available as of March 1983, indicate that the largest single number of Volunteers requested were for water supply (293) and irrigation (126) projects. This figure represents more than 12 percent of the total number of Volunteers requested. (Tomaro, John B., *An Assessment of the Water and Sanitation Sector in the Peace Corps Program: Role of the Office of Program Development*, Research Triangle Institute, 1983.)

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*Produced by Peace Corps' Office of Planning Assessment and Management Information.

Common Problems of Water Projects*

The common problems associated with Peace Corps rural water projects parallel to a large degree those stated in the World Bank Paper, *Village Water Supply* (March 1976). Although they naturally overlap, the problems are grouped into three broad categories in the Paper--institutional, financial, and technological.

Institutional:

- There is lack of a rural water supply policy forming part of a national water supply policy.
- There exist several government agencies whose lines of responsibility overlap or are ill-defined.
- There is a lack of institutions capable of project development.
- There is a lack of water organizations at the local level.
- There is a lack of trained manpower at every level.
- There is a lack of criteria for project evaluation and priority selection.

Financial:

- Per capita costs, for a given level of service, increase as village size decreases.
- Villagers have relatively low income and there are limited village financial resources.
- There is a lack of policy to obtain maximum financial support from areas to be served.
- There is a lack of local government infrastructure, an inability to collect and retain locally collected taxes for local use, and difficulty in collecting fees for water users.
- There is a lack of village motivation and of public health education, so that villagers are unaware of the potential benefits of improved water systems and are not willing to pay for them.
- The rural population may return to water from ponds, streams, shallow wells, and other sources of questionable quality if high charges for piped water are imposed.

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*This section is excerpted from a 1979 survey of potable water projects by the Water/Sanitation Sector Specialist in OTPS. (Hafner, Craig, *Water and Sanitation in the U.S. Peace Corps*, 1979.) Many of these problems prevail today in projects with water/sanitation components.

Technological:

- Records show a short operating life for equipment, poor maintenance, and many project failures.
- There is a lack of local capacity to fabricate simple, reliable equipment for which spare parts and service would be available locally.
- The various national agencies use a wide variety of types and makes of equipment, compounding the problem of operation and maintenance.
- Severe communications problems exist between remote rural systems and their support organizations, so that system breakdowns are not reported promptly.
- There is difficulty in obtaining spare parts due to lack of money, scarcity of foreign exchange, cumbersome procurement procedures, problems of logistics, and absence of a support agency which maintains an inventory of needed parts.
- There is difficulty in providing sufficient repair staff and transport to attend promptly to breakdowns, especially when breakdowns occur in widely dispersed rural systems with very poor road links.

According to Water and Sanitation in the U.S. Peace Corps (Hafner, Craig, 1979), by far the most crucial problems are the institutional and financial ones; if these could be resolved, the technological problems would largely disappear.

Water Resource Management: An Integrated Approach

Peace Corps water/sanitation programming for the 1980s aims to develop more fully the supportive role of water/sanitation work in agriculture, environmental conservation, and health and other programs. More and more Volunteers may be using water-related skills to develop livestock watering points or small-scale irrigation systems for crop production, including household gardens. These activities can increase food supplies and cash incomes as well as provide nutritional variation and water supplies for year-round domestic use.

Similarly, encouraging water conservation practices can provide better potable water supplies, while erosion control efforts prevent flooding and maintain water tables.

Water supply, sanitation, and health are closely inter-related in Peace Corps programming. Improved sanitation and availability of water in or near villages reduce exposure to the vectors of malaria, onchocerciasis, and schistosomiasis. Improvements in the accessibility and quality of water are important in the reduction of dysentary and guinea worm. (Jones, B., Household Water Supplies, 1981, p. 7.) On the other hand, a possible increase in disease vectors must be dealt with in planning irrigation schemes.

The Jones report states that providing water without sanitation or education on the relationship of water, sanitation, and disease may only conserve the energy of the water carriers and have little impact on the levels of disease and death. Water is necessary for improved health, but is not effective without supporting factors. "Personal and domestic hygiene, storage, water-use patterns and sanitation all determine, to some degree, whether water supply improvements will contribute to the realization of health benefits." (Jones, 1981, p. 12). Since diarrheal diseases and malnutrition are cyclical, each contributing to the severity of the other, it is important, says Jones, to improve nutrition as well as provide clean water supplies.

Above all, water supply/sanitation projects must incorporate an educational component. According to the Sierra Leone Country Management Plan for FY 1982 (p. 2), educating people in health is the real challenge. "If they understood the nutritional requirements for growth and good health, they would certainly feed their children better. If they understood the germ theory of disease, they would improve their sanitation practices."

The Role of Women

Because women draw the water, bathe the children and educate them in hygiene, launder the clothes, and do the kitchen gardening, they are the principal targets of water and sanitation activities.

> . . . because cultural inhibitions can and do provoke misuse and underuse of safe water supply and waste disposal systems, it is critical that adequate health education and community participation efforts involving women become integral components of planning strategies. Third world women, the traditional drawers and carriers of water, can play a significant role in promoting community acceptance of improved water supply and sanitation programs. . . . Until women are involved and understand the importance of good sanitation, we can expect limited acceptance. Once the women understand, they can play key roles in household decisions relating to changing behavioral patterns and to socializing children in similar behavior and attitudes in areas such as personal hygiene and sanitation. (Elmendorf, Mary, Women, Water, and Waste: Beyond Access, pp. 9 and 12.)

Recognizing the basic role of women in water and sanitation aspects of daily living, 30 nongovernmental organizations at the 1977 UN Water Conference in Mar del Plata issued the following statement for developing countries to consider when preparing their national plans.

(a) Include strategies to develop human resources at the community level to meet local needs.

(b) Ensure equal access for women to training with regard to the maintenance, management, and technology of water sources and supplies.

(c) Ensure that women be included in any educational programs on the use of water and its protection from contamination.

(d) Ensure the participation of women in local councils and planning boards responsible for making decisions on community water supply.

(e) Recognize the increasingly effective role that women, NGOs, and other women's organizations can play in the education of public opinion for needed change.

("Special Situation of Women in Regard to Water," Statement prepared by the Non-Governmental Organizations Committee on UNICEF for the Preparatory Committee, United Nations Water Conference, January 1977, from Elmendorf, p. 10.)

Most Peace Corps water and sanitation projects in the past have not included host country women, but many have begun to do so. Paraguay's Environmental Sanitation and Rural Health Projects are good examples of an integrated approach to water, sanitation, and health education involving women at all stages.

Washington's Coordinating Efforts

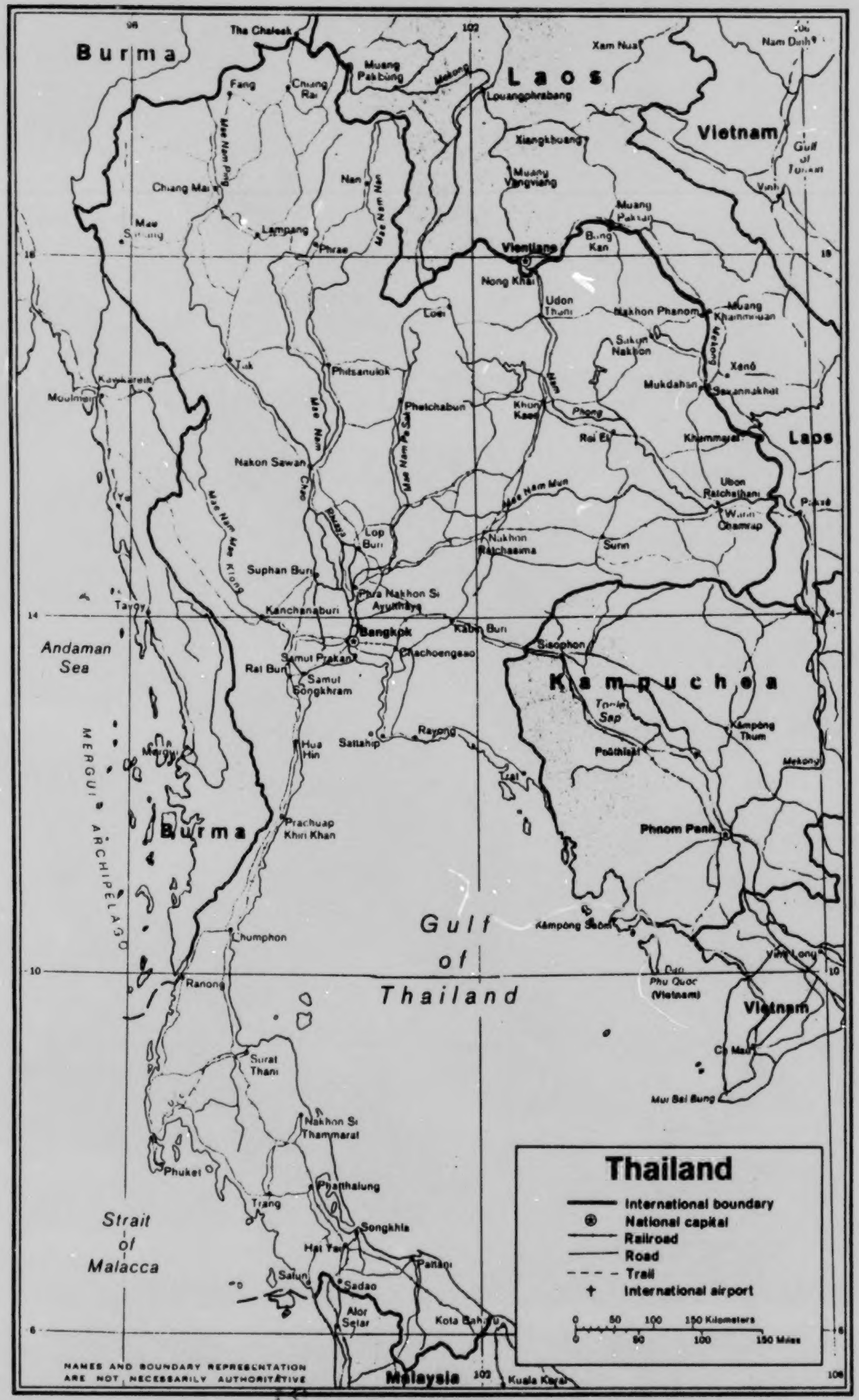
Over the years, programming in the area of water/sanitation--as in other areas--has become increasingly complex. Water supply and sanitation activities now often take place in the context of an integrated approach to development involving many other program areas. Community involvement, especially of women, is now recognized as a primary requisite for success.

Assistance is available to Peace Corps programmers attempting to deal with these complexities in the field through the Water/Sanitation Sector, Office of Training and Program Support (OTPS). The sector office was established in 1979 to focus on improving the quality of Peace Corps' programming and training in water/sanitation. Early sectoral efforts centered on potable water and sanitation in response to the emphases of the U.N. Water Decade and the goal of meeting basic human needs.

Sectoral efforts have expanded in the 1980s to encompass water resource management and sanitation activities in support of projects in agriculture, health, and other areas emphasized in the Forward Plan. The water/sanitation sector staff coordinates technical information, ideas, and consultants to support water and sanitation activities in all sectors in the field; develops strategies to improve the quality and increase the quantity of both projects and pre-service and in-service training models; and encourages appropriate collaboration among Peace Corps, private voluntary organizations (PVOs), and international donor organizations participating in the UN Water Decade.

This collection of case studies is another tool for improving the quality of Peace Corps' programming and training in water and sanitation. Looking at the following case studies and analyses, the reader may note the improvements over time in areas such as Volunteer training, use of counterparts, development of national rural water supply policies and coordinating committees, and community participation. Each country takes a different approach to the degree of integrated programming and the methods of solving administrative, managerial, and financial problems. All have valuable lessons to offer others working in water/sanitation worldwide.

KINGDOM OF THAILAND
CASE STUDY AND ANALYSIS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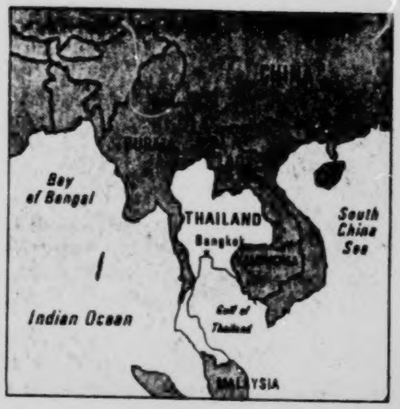
COUNTRY BACKGROUND*

Geography



Thailand is a country with an area of 514,000 sq. km (198,500 sq. mi.), located in the heart of mainland Southeast Asia. The shape of the country has often been compared to the head of an elephant with its trunk extending along the Gulf of Thailand down the Malay Peninsula. The capital city, Bangkok (pop. 4.9 million), is located on the Gulf. Other major cities are Chiang Mai (pop. 106,000) in the Northwest, and Nakon Ratchasima (pop. 87,000) in the center of the country.

Much of Thailand's history and politics are the result of its axial positon in Southeast Asia. Although Thailand does not touch China or Vietnam, areas of both countries are within 100 kilometers of Thailand.

Thailand's terrain consists of four general regions--a densely populated central plain watered by the Chao Phraya River system; an eastern plateau bordered on the east by the Mekong River; a mountain range spanning the country in the west and separating the plain and plateau in east-central Thailand; and the southern isthmus, joining the land mass with Malaysia.

Thailand's tropical climate is dominated by monsoons, with high temperatures and humidity. Most regions have three seasons: rainy (June-October), cool (November-February), and hot (March-May). Rainfall varies but is generally heaviest in the south and lightest in the northeast.

People

In 1981, the estimated population of Thailand was 48.3 million, with an annual growth rate of 2.1 percent.

Thailand's society is relatively homogeneous. More than 85 percent of the people speak a dialect of Thai and share a common culture. The majority of the population is Thai (75 percent) and Buddhist (95.5 percent). Thai is the official language, taught in schools and used in government.

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*Excerpted from Background Notes, U.S. Department of State, Bureau of Public Affairs, July 1982, and Peace Corps/Thailand Country Management Plans.

The largest minorities are the Chinese, with perhaps eight percent of the population, and the Malay-speaking Muslims, with three percent. Other groups include the Khmer; the Mon, who are substantially assimilated with the Thai; and the Vietnamese, who are not. Smaller, predominantly mountain-dwelling groups total about 500,000.

Thai society is predominently rural and most heavily concentrated in the rice-growing areas of the center, northeast, and north. The urban population (15 percent) is concentrated in Bangkok. Occupational distributions reflect this population distribution. In 1981, 76 percent of Thailand's estimated work force of 23.4 million worked in agriculture, 9 percent in industry and commerce, 9 percent in service, and 6 percent in government.

Compulsory, universal free public education has been expanded from four to seven years. In 1979, 82 percent of primary school age children were enrolled in school, 26 percent of secondary age children were in school, and about 3 percent were in universities or colleges. In 1981, the literacy rate was 85 percent.

The Physical Quality of Life Index (PQLI) is 75.* The PQLI for the NANEAP Region PC countries ranges from 22 to 86. Thailand ranks fourth of 12.

Government

A revolution in 1932 transformed the Thai system of government from an absolute to a constitutional monarchy. Under the new constitution of December 22, 1978, the 14th constitution since 1932, the King is formally the head of state. Although he has little direct power, he is an important popular symbol of national identity and unity.

The Prime Minister is the head of government and center of political power. The Prime Minister heads and may personally select the cabinet (Council of Ministers) of up to 44 ministers and deputy ministers.

The bicameral National Assembly is the legislative body of the Thai Government. The 301 members of the lower house are popularly elected; the 225 members of the upper house are nominated by the Prime Minister for formal royal consent and appointment. The power and influence of the two chambers are about equal. However, the lower house exercises greater control over money bills and can vote no-confidence motions against a sitting government.

The judicial branch consists of three levels of courts. The Supreme Court is the highest court and its judges are appointed by the King. The legal system blends principles of traditional Thai and Western law. Law dealing with family and inheritance matters is rooted in traditional laws and customs, while criminal, civil, and commercial codes are adapted from British and European legal systems. In the far south, where Muslims constitute the majority of the population of several provinces, Koranic law is also applied.

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*The Physical Quality of Life Index (PQLI) was developed by the Overseas Development Council as a non-income measurement that summarizes many aspects of well-being. The PQLI is calculated by averaging indexes on a scale of 0 (the most unfavorable performance in 1950) to 100 (the best performance expected by the end of the century) for infant mortality, life expectancy, and literacy into a single composite index.

For administrative purposes, Thailand's 73 provinces are subdivided into 642 districts. Governors of the provinces and district officers are appointed by the Ministry of Interior. Larger towns are administered through the shared authority of elected municipal assemblies and district officers.

In the countryside, village leaders are popularly elected and given official positions and limited authority by the central government. Groups of villages are loosely aggregated into tambons or "communes." Leaders from the tambons elect one of their members to serve as kamnan, or "commune chief." This local democracy has been traditional in Thailand.

There is universal suffrage for adults over age 20.

Economy

Endowed with considerable natural resources--including tin, rubber, natural gas, timber, fisheries products, and tungsten--Thailand has demonstrated impressive growth in its domestic economy. In 1981, the GNP was $36 billion, with an annual growth rate of 6.8 percent. Per capita income was estimated at $758. The inflation rate was 12 percent. Thailand is in the middle range of developing nations. Foreign trade and investment are an important part of the economy. Thus, in recent years, high international interest rates and declining prices for many exports have slowed Thai economic growth.

Agriculture constitutes 26 percent of the GNP. Land is 24 percent agricultural, and important crops are rice, corn, sugarcane, manioc, and rubber. Harvests are consistently larger than domestic consumption, and Thailand exports large quantities of food each year.

Industries and the services sector are also important and have contributed to the consistently rapid growth of the Thai economy. Industries constitute 27 percent of the GNP. Major industries include textiles, wood products, tin and tungsten mining, and agricultural processing. Tin and textiles are the major exports.

Tourism is an important growth industry. Thailand attracts travelers from all over the world, who come to visit the temples, to purchase gems and handicrafts, and to enjoy the beaches and resorts.

Foreign investment is important in Thailand. Multilateral financial institutions, such as the World Bank, the Asian Development Bank, and foreign governments provide official credits. Large-scale, energy-related projects, including the development of gas resources in the Gulf of Thailand, the exploitation of lignite (brown coal) deposits in the northeast, and transportation and electricity supply throughout the country, have been financed from abroad. Private investment is encouraged, and most important sectors of the economy are privately owned and operated. The Thai government recognizes that the continued supply of new capital will be necessary to achieve further growth.

Social and economic trends include increasing urbanization, expansion of industrial activity at a faster rate than agriculture, and growth of incomes in service industries. These trends are often associated with growth and modernization, but they have also produced problems that the Thai government recognizes and seeks to relieve. Bangkok faces housing problems and severe pressure on basic services, including water, energy, and transport facilities. In addition, because the area of land under cultivation is unlikely to increase, income growth can only result from greater productivity per hectare, as well as from more efficient industrial production. A national planning agency has been established to meet the problems that development poses. Budgetary resources for implementing the national plan have been increased in each of the recent annual budgets.

Water/Sanitation

Health

Life expectancy has increased to 62 years in 1981, and infant mortality is estimated to be 68 per 1,000 live births, although this figure varies greatly between the urban and rural areas. The major diseases are water- and food-borne diseases (gastrointestinal infections and parasitic diseases), vector-borne diseases (malaria and dengue hemorrhagic fever), and respiratory infections (tuberculosis and pneumonia). It is estimated that one-third of the population is affected by water- and food-borne diseases annually. In addition, there is a serious malnutrition problem, particularly among mothers and children. (CMP FY1983, p. 6.)

Health problems are closely related to the lack of potable water in many rural areas. Only about 12 percent of the rural population had access to safe water in 1977. Four hundred sixty piped water-supply systems served about 1,200 villages (2,000-5,000 population each). Villages with less than 1,000 people were served through wells, ponds, tanks, and rainwater cisterns. (WHO Water Sector Digest, 1978.)

Agriculture

There is a large income disparity between Thailand's four geographical regions. Although Thailand's PQLI is relatively high, approximately 30 million Thais earn less than $250 per annum, and 11 million of these fit into the World Bank's definition of absolute poverty ($99 for rural dwellers and $140 for urban dwellers). Nine-tenths of the poor live in rural areas with over half located in the Northeastern Provinces. The poor are concentrated in the agriculture and unskilled labor sectors. (Country Development Review, FY1983.)

As noted previously, most of the land suitable for agriculture is now in use, and farm expansion is coming to an end. In the past, this available land had allowed subsistence farmers to maintain holdings as large as they could work. Future trends indicate the need to break up the holdings of subsistence farmers, thus decreasing their incomes. In sections of the Northeast and North Regions, there is nothing except subsistence farming. The government is placing top priority on reducing absolute poverty and accelerating rural development in these areas.

In order to achieve the Fifth Five-Year Plan target agricultural growth rate of 4.7 percent, Thailand will have to intensify productivity on existing agricultural land. This change to intensive farming will require significant assistance to the small farmers (87 percent of farm households are self-employed). The Royal Thai Government's (RTG) efforts include conducting appropriate research; developing irrigation projects; creating small-scale water resources; expanding the National Agricultural Extension Programs; reinstating the Tambon Development Program with a 1982 allotment of 3.65 billion baht for employment generation/drought relief; and extending credit. (Country Development Review, FY1983.)

Irrigation is an important part of this strategy to alleviate poverty in rural areas. Thailand's irrigation policy is to carry out schemes that will help provide the water to increase the country's annual farm output. In order to implement this policy, several government agencies have been carrying out irrigation projects since 1964.

In 1981-82 the Royal Irrigation Department (RID) was working on 500 small irrigation projects, each of which cost a maximum of 3.0 million baht and was expected to be implemented in one year. At the present time, the emphasis is on developing small water resources and plans for water usage. Impressive improvements have been made, but there is still a great need for more water to increase agricultural production.

Implementing Agencies

The RTG is highly centralized. Most of the executive power rests in the Office of the Prime Minister, and various Ministries and Departments. The National Economic and Social Development Board (NESDB), the Budget Bureau, and the Civil Service Commission hold most of the authority for policy-planning, budgeting, and personnel administration.

A look at the structure of the RTG reveals a number of overlapping areas of administration. There are 14 agencies involved with different aspects of agricultural extension and promotion of agricultural occupations, 16 agencies involved in the promotion of farmers' organizations, and 31 agencies responsible for various economic infrastructural projects in rural areas.

This has an impact in the area of water supply and sanitation. For example, the Metropolitan Water Works Authority (MWWA) and Provincial Water Supply Division (PWSD) share the responsibility for urban water supplies. The National Rural Water Supply Committee (NRWSC) coordinates the work of several agencies: Rural Water Supply Division for piped supplies and handpumps; Accelerated Rural Development Office (ARD) for big tube wells and shallow dug wells; the Ground Water Division (GWD) for large tube wells/power pumps; Well Drilling Section (WDS) and Sanitation Division (SD) for institutional water supplies. There is a proposal to convert the PWDS into a Provincial Water Supply Authority responsible for rural piped water schemes and to vest the RWSD with all low-level technology rural schemes. (WHO Water Sector Digest, Thailand, 1978.)

OVERVIEW OF CASE STUDY PROJECTS INVOLVING WATER/SANITATION*

Name	Year(s)	Goals/Activities	Size**
Malaria Eradication Project	1962-present	Since 1962, PCVs have surveyed and eradicated malarial mosquito breeding sites, and sprayed houses near such sites.	Medium
Agriculture/Rural Public Works Project (became WRD)	1969-75	PVCs worked to raise farmer incomes by assisting the Community Development Department to improve water resources by developing infrastructures--spillways and dams. They designed and conducted preliminary surveys and site checks, supervised construction, and trained counterparts.	Large
Water Resources Development (WRD) Project	1975-present	This large infrastructure development project has focused on small dams, spillways and irrigation canals. To date, PCVs have surveyed and designed 350 projects, supervised construction of 105 projects, increased irrigable farm areas to 210,000 acres affecting 21,000 farm families, and conducted counterpart training.	Large
Land Development Project	1970-78	PCVs developed and improved water resources for irrigation to counterbalance low rainfall levels.	Medium

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*This information is taken from Phase I, the Survey of Peace Corps Water and Sanitation Activities from 1970 through 1982.

**Project size is indicated as follows: "Small" represents under five Volunteers; "Medium," 6-12; "Large," 13 or more. Number of Volunteers varied from year to year, therefore this label indicates an average.

TIMELINE OF SIGNIFICANT EVENTS COVERED IN THE THAILAND CASE STUDY

	1962	Peace Corps Entry National Malaria Eradication Project begins
Rural Public Works (RPW) Project begins (Community Development Department)	1969	
	1970	Thailand Land Development Project begins
RPW project moved to LAD to become Water Resources Development Project	1975	Government begins program focusing on rural development and decentralization of funds.
	1979	Northeast Integrated Rural Development Project begins

HISTORY OF PEACE CORPS WATER/SANITATION ACTIVITIES

Water Volunteers in Thailand have been involved in rural development activities, mostly focusing on increased crop production but also on providing year-round domestic water supplies. These PCVs have been professionally trained engineers. Health Volunteers engaged in water/sanitation activities have been skill-trained generalists.

The success and continuity of PC/T water projects is due to several factors:

- collaboration with only one Ministry with coordination provided by a department in the Office of the Prime Minister;
- government support in planning, funding, training, and site visits;
- bottom-to-top and top-to-bottom involvement in project selection and implementation;
- Thai research on appropriate technologies and its incorporation into PC/T training; and
- sharing of information through semi-annual PC conferences, an engineer's newsletter, blueprints on file, and monthly reports.

AGRICULTURE/RURAL DEVELOPMENT

To help small farmers increase their agricultural productivity and for better farm income and standards of living, Peace Corps/Thailand has made water resource development a priority project focus since 1969. (CMP FY1983.)

Most crop cultivation takes place in the wet season because of the dependence on rainwater. With irrigation, a second crop in addition to the traditional rice crop is possible, thus doubling farmer income. Approximately 3.1 million hectares of Thailand's agricultural lands are considered to be irrigable. However only 0.3 percent of the total irrigable area is actually under full irrigation.

Agriculture/Rural Public Works Project (1969-75)

Collaborating Agencies:* Peace Corps, Ministry of the Interior's Community Development Department, Rural Public Works Section.

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*Agencies may collaborate on projects in a number of ways: funding such as by the World Bank, EEC, USAID; in a cooperative effort such as with CARE, CRS, CUSO; or as part of a signed agreement such as with TransCentury Foundation or a Ministry of Health.

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Starting in 1969, Peace Corps' Agriculture/Rural Public Works project assisted the Rural Public Works Section of the Community Development Department in improving water resources by developing an infrastructure system. The system included small spillways, dams, dikes, ditches, roads, and bridges. Project workers assisted in designing, doing preliminary surveys, doing site checks for potential new structures, supervising construction, and training Thai team members.

Volunteers served as members of extension teams in organizing, planning, and construction. (Project Summary Sheet, 1973.) They concentrated on small dams projects because, more than bridges and roads, dams for irrigation could permanently raise cash income and because Volunteer training in one type of construction could be accomplished in a short period of time.

Volunteers with civil engineering and construction backgrounds were assigned to the Provincial Community Development (CD) Officers, who then assigned them to individual projects planned and budgeted for by the Department. Villagers contributed their labor and the Volunteers cooperated with the local village CD workers in organizing construction.

Over the years, dam construction has indeed resulted in an increase in farmers' incomes through expanded agricultural production. These projects have often also provided village water supply for household consumption year-round. (CMP FY1973, p. 13.) For example, one Volunteer designed and supervised the construction of a small, homogeneous earthfill dam and box-drop outlet with a baffled stilling basin which now provides water for a community of 7,000. (Questionnaire.)

The Agriculture/Rural Public Works Project focused on Thailand's poorest region, the Northeast. From 1969 to 1972, a total of 40 Volunteers informally trained 120 community development workers, and designed and constructed 600 projects for dams, spillways, bridges, and roads--80 percent being small dams and spillways. The results were more water for irrigation and easier ways for small farmers to get produce to market. (Project Summary Sheet, 1973.)

The American presence in Southeast Asia in the early 1970s caused some uneasiness in the Thai Government and consequently the number of Peace Corps Volunteers incountry was reduced. Fill rates for agriculture/rural development projects also dropped off--43 percent of requests were filled in 1974 and 62 percent in 1975--partly due to a sudden sharp increase in Peace Corps requests worldwide for agricultural skills. Agriculture Volunteers, including those involved in rural public works, dropped from 60 to 29 in two years. There were 14 Volunteers in the CD rural public works project in 1973 and 17 in 1974. (Peace Corps/ Thailand Activities in 1976, p. 2.)

Water Resources Development Project (1975-present)

Collaborating Agencies: Peace Corps, Ministry of the Interior's Local Administration Department (LAD) and Accelerated Rural Development Office (ARD)

As of this writing, Volunteers in the Water Resources Development Project continue the Rural Public Works Project objectives of assisting rural communities in obtaining irrigation and domestic water supply. These objectives include promoting more efficient use of water as an agricultural asset and providing a source of water during the dry season. Urban areas are assisted with improved roads that can be used year-round, and storm water drainage systems that will eliminate rainy season flooding. (Questionnaires.)

By January 1975, inadequate financial and material support caused a shift away from the Rural Public Works Project. Volunteers with the same skill backgrounds and job responsibilities were recruited and placed instead in the Department of Local Administration (LAD), Ministry of Interior, which handles small water resources projects. Volunteers were requested by and assigned to Provincial Administrative Organizations, under the coordination of LAD, to work on irrigation and other water resource projects in rural areas.

The change in requesting agency was made both to improve Volunteer utilization and to assure better access to the provincial budget rather than continue dependence upon authorization from the Central Government offices in Bangkok under the Community Development Department (CDD) program. Under the CDD directed program, it could take up to one year to get funding for projects which Volunteers had surveyed and designed. With LAD, the money to be made available for most of the projects came from the local budget within the province and required less processing. (CMP FY1977, p. 25.) This system continues today.

Under the new arrangement, Volunteers are responsible to the Deputy Governor of the Province and therefore can work with all department representatives under the provincial administration. Projects can be funded from a variety of sources including the central budget, provincial budget, and tambon (group of villages) council funds.

The continuing need for increased/improved rural water supplies was a result of the inadequate distribution of rainfall, as well as human factors such as the destruction of forest reserves due to shifting cultivation practices, little government attention to small water resources projects, and the lack of well-trained engineers at the local level to develop small water resource projects. The lack of water often led to lower farmer income and increased migration of population from rural to urban areas creating unemployment and social problems. As a result, RTG's Fourth National Development Plan (1977-82) put more emphasis on the expansion of water delivery systems and paid more attention to small water resources development projects at village, tambon, and district levels. (CMP FY1977, p. 26.)

In 1975, the Government launched a new program to decentralize rural development financing and accelerate rural public works on the village level. It allocated additional funds of about B480,000 to each tambon and proposed to increase that figure by 30 percent the following year. The funds were intended to provide employment and income to villagers between the growing seasons by having them work on rural public works projects in their own villages.

The primary beneficiaries of the Water Resources Development Project have been rural families. Beneficiaries have an average fourth-grade education level and income of less than $300 per year. Farmers are principal targets, but villages gain year-round potable water supplies which reduce the distance women must travel to collect water. (Questionnaires.)

As in the Rural Public Works Project, Volunteers have been involved in projects for earth dams, spillways, canals, wells, roads, schools, bridges, and water control works such as weirs, culverts, and gates. Volunteers perform preliminary site investigations--including hydraulic and topographic surveys--to determine project feasibility, perform cost estimates and estimates of benefit-cost ratios, design projects, supervise construction performed by local contractors using local labor, help acquire funding, and train host country counterparts.

Location of assignment determines with whom a Volunteer will be working. Where there is an Accelerated Rural Development (ARD) office , the PCV shares offices with one or more civil engineers who generally are working on other public works projects. In non-ARD provinces the PCV usually works with an engineering technician and draftsman of the Provincial Public Works Office. (TAC 1983.)

Projects that Volunteers work on are determined by the province engineer, with suggestions by village headmen, by community development workers, or by the District Officer. (Questionnaires.)

One difficulty Volunteers encounter with the Water Resources Development Project is the fact that they must "wear two hats." For project implementation, the Volunteer works with the Department of Local Administration, but for obtaining heavy equipment he must go to the Accelerated Rural Development Office. Separate budgets and authorities complicate progress. (Khanobdee Interview, 1983.)

The organizational structure of the provincial administration does not include a position for a degreed Thai civil engineer at the provincial level. The provincial "engineer" is usually a technical school graduate, frequently capable, but without the engineering training required to survey and design any but the simplest water resource projects. Peace Corps Volunteers are often the only degreed civil engineers working on small irrigation projects in the ARD or Public Works office in a province, since these projects are too small to come under the responsibility of the Royal Irrigation Department. The work of these engineer Volunteers has begun to demonstrate the value of assigning engineers to perform these duties, since they are capable of designing structures which are technically suitable to rural locations and will last for a long time. In addition to providing needed skills, one objective of this project is to carry on this activity widely enough and long enough to demonstrate the value of permanent involvement of Thai graduate engineers in activities concerning small water resource projects. (CMP FY1977, p. 25.)

There is a mutual exchange of skills as well as cross-cultural benefits in the cooperative relationship with local staff, laborers, and village irrigation committees. Because Volunteers implement projects in villages and subdistrict towns, they work closely with local farmers as well as officials at the provincial level. (Questionnaires.)

In most cases, people in the communities are involved in planning and carrying out projects. They assist in the selection of project sites and provide the labor and materials for construction. Volunteers generally have regarded community support as excellent.

The work schedule is influenced by seasonal weather. Most construction is performed in the dry season, whereas survey and design is accomplished in the monsoon season. Considerable time may be spent in the field, staying with village families during the construction season. The Volunteer lives in a town of 10,000 to 50,000 people, renting a house shared with a coworker. Since frequent travel is required, the Volunteer may purchase a motorcycle. The Peace Corps living allowance and Thai Government per diem cover loan costs and maintenance. (CMP FY77.)

Over the years, the number of Volunteers has grown as more projects have been designed and constructed. In 1978, Peace Corps/Thailand requested an additional staff slot from Washington to provide technical advice and handle programming in water resource development. Existing staff members could only provide Volunteers with administrative support and supply materials and technical information through outside sources. In-service training for Volunteers in the program was dependent on outside consultants. (CMP FY1979.)

Volunteer Involvement in the RTG Rural Employment Generation Program

In 1982, 13 WRD PCVs, seven PC staff members, and six trainees participated in the Annual Local Administration Department Conference at Khon Kaen University. The topic was the 1983 Rural Employment Generation Program (REGP). (Annual LAD Conference Proceedings, 1982, p. 3.) The purpose of the meeting was to familiarize PCVs and Canadian University Service Overseas (CUSO) Volunteers with the program so they could help in planning projects and assist in implementing such projects when needed.

The overall purposes of the program, which has a strong water/sanitation component, are:

(1) to distribute income to rural people in the dry season by means of small project construction;

(2) to develop and strengthen the capability of tambon councils in decisionmaking, management, construction supervision, and maintenance of small projects; and

(3) to promote intra-level collaboration of officials in providing assistance to tambon councils in implementing REGP small projects.

Priorities for small projects are in the following order:

(1) weirs, regulators, flood protection dikes, spillways, storage dams, retaining walls, old-type diversion structures;

(2) canals, distribution structures;

(3) dug ponds, swamp dredging, and fish ponds;

(4) water tanks, jars, shallow wells;

(5) deep wells, pipe water systems;

(6) silos, rice mills, wind mills, rubber plants, market places, silk worm houses, nurseries, driers;

(7) access roads, bridges, culverts, walkways;

(8) health centers, public laboratories; and

(9) Office of Tambon Council, training centers, child development centers.

As of this writing, the project is still in its early stages and its contribution to the goals of PC water/sanitation programming cannot yet be gauged.

Appropriate Technology

WRD Volunteer engineers were involved in a recent appropriate technology initiative which successfully developed a low-cost windpump for high-volume, low-head irrigation use. (Sherman, 1983.)

The Governor of Phattalung Province in southern Thailand sought to alleviate the inefficient land use and chronic unemployment in his area. In 1981, he received funding from UNICEF to purchase and install one multibladed, steel windpump as a demonstration of the practicality of using windpower for crop irrigation. Although Thais had traditionally used windpumps for irrigation, old designs made of wood and sailcloth were inefficient and required much maintenance. Improved designs employed diesel pump units which were prohibitively expensive.

A PCV engineer advised the Governor that the steel windpump was inadequate and contacted the Peace Corps technical advisor in Thailand for alternative designs. In mid-1982, UNICEF funding having expired, the American Baptist Mission funded the installation of a VITA (Volunteers in Technical Assistance) bamboo-bladed prototype.

A local craftsman was contracted to fabricate the parts, the design and supervision of which were provided by VITA, and the PCV designed the tower foundations for local soil conditions and supervised the site selection, excavation, and construction of the foundations. Land was supplied by one of the farmers and local farmers provided the labor.

When the first windpump was completed and successfully operating, the Governor ordered another constructed nearby using discretionary funds of the local district agricultural extension office. This windpump was completed two months later using a modified blade design of curved, laminated wood veneer. The new, lower-cost design allowed for better quality control, better performance, and a longer working life. The RTG has established a goal of introducing 9,000 new windpumps by 1987, and Thailand's National Energy Administration is considering this design for possible nationwide dissemination.

The farmers requested that the annual development funds allotted to their district by the Ministry of Interior be used to purchase and install ten additional wind pumps. The farmers promised to provide all cement, steel, and labor required for the foundations and the irrigation canals to bring the water from the windpumps to their fields. Village workdays were organized when 200 or more people worked together to dig the several kilometers of new irrigation canals that bring the water to the fields from the wind pumps. A second PCV improved the foundation design and helped lay out the canals.

The windpumps will bring water up from larger canals that are connected to a nearby large fresh-water lake. The water from these 12 windpumps will supply irrigation to more than 100 small farms during the dry season, allowing for the planting of cash crops and employment of laborers.

Monitoring and evaluation of the Water Resources Development Project involve quarterly Peace Corps and LAD staff visits, PCV monthly reports, Department of Technical and Economic Cooperation (DTEC) evaluation reports, and PCV conferences and seminars. (CMP FY1977, p. 11.)

When the WRD project began, Volunteer recruitment required a B.S. in Civil Engineering or a B.S. in Mechanical Engineering with at least one year's experience in the design of concrete structures. No females were accepted "due to field living conditions where quarters must be shared with male co-workers." (TAC, CMP FY1976.) This restriction was dropped in 1979.

Recruitment and Accomplishments

Volunteer numbers and accomplishments from 1976 to 1982 are shown in the following table.

Year	Number of Volunteers	Accomplishments
1976-77	16-20	Designed and constructed small dams, spillways, reservoirs, culvert and irrigation canals for 83 projects. Projects irrigated more than 130,000 hectares. (CMP, FY1976, p. 7.)
1980	15	Completed construction of one irrigation canal, two irrigation check structures, one box culvert, three earth dams with reservoirs, one water supply system, one storm drain system, four diversion dams, one windmill with water pump, and two large farm ponds. These projects served about 1,100 rural families. Each PCV surveyed and designed five projects, a total of 75 projects which were ready for funding and implementation. (CMP FY1980, p. 91.)
1981-82	15	Trained 105 coworkers and 320 construction foremen/village laborers, provided work for 1,000 local skilled laborers. Finished projects serving 2,300 farm

families: two irrigation canals, three irrigation check structures, three earth dams, six diversion dams, two farm ponds, and 40 shallow wells. Surveyed and designed 75 projects. (CMP FY1982, p. 28.)

Requests for Volunteer water resource engineers for 1983 ask for technicians, male or female, with an A.A. degree in Civil, Structural, Sanitary, or Environmental Engineering with two years' experience in designing and building water/sanitation systems or engineers with a B.A. or B.S. in the same fields. (TAC 1983.)

As of June 1983, there were 15 engineer Volunteers working in the Water Resources Development Project in 14 provinces. Peace Corps/Thailand is willing to expand this project further if there are sufficient engineer candidates and strong interest and support from the Ministry.

Program Status

The Water Resources Development Project receives considerable support from the Ministry of the Interior. The Minister has on occasion visited sites demonstrating approval and appreciation for the work. Television coverage has promoted various projects. Volunteer engineers are in continual demand for more project design. (Questionnaires.)

In 1979, the Water Resources Development Project was in third place in Peace Corps/Thailand's priority ranking. It was not ranked higher primarily because engineers were relatively difficult to recruit and because the nature of the RTG budgetary system sometimes resulted in long delays and less than adequate support for construction projects. Volunteers had difficulty understanding the government funding process. This was particularly true in provinces in which local taxes were not adequate and there was a heavy reliance on the central budget. (CMP FY1980.)

At present, this program is rated second in PC/Thailand's overall priority ranking. The change came about for the following reasons. (1) It is one of the top priorities of the government concerning water resource development. (2) The LAD has given considerable support to the program in staff time. (3) The Volunteers have high job satisfaction. (4) The program provides direct long-term benefit to farmers. (5) The benefit to the Volunteer and host nationals in terms of cross-cultural experiences is among the highest of any PC/Thailand program. (Charles, May 1983.)

However, Peace Corps/Thailand believes the Water Resources Development program cannot continue to be effective without being complemented by other development programs. The aim of the program is to develop small water resources, but management of these resources a primary concern. Complementary PC/T programs may include:

- land development, in which ag extension Volunteers develop irrigation systems at the farm level;

- crop extension, in which volunteers help farmers to develop a cropping system based on more effective use of water to produce more food, feed grain, rice bran, livestock, and fish; and

- fisheries development, in which Volunteers advise farmers on the adaption of ponds to fish culture.

In recent years, PCVs in the Agriculture and Rural Development program have been playing a major role in bringing the resources of different agencies, including WRDP, to bear on agriculturally related problems. (CMP FY1983.)

Thailand Land Development Project (1970-78)

Collaborating Agencies: Peace Corps, Department of Land Development.

In 1970, the Thailand Land Development Project was established to raise farmer incomes. This goal was to be accomplished by: (1) introducing farmers to soil conservation methods and improved crops which would provide optimum market return and produce highest yields for soil conditions; and (2) developing and improving water resources for irrigation to counterbalance low rainfall levels. (Project Summary Sheet, CMP FY1973, p. 31.)

The project was concentrated in the Northeast, Thailand's poorest region. Agricultural extension agents helped farmers learn to use new irrigation systems, extending the benefits of dams and reservoirs by using dikes, ditches, and drainage systems.

From 1970 through 1972, ten Volunteers established 200 demonstration farms and helped about 600 farmers adopt improved practices. Farmers' incomes doubled when they grew a second crop after the rice was harvested. In 1973, there were seven Volunteers in the program, and this number grew to 12 in 1974 and 1975.

HEALTH

Until the early 1950s, malaria was the major cause of death and illness in Thailand. By 1972, it had been reduced to the fifth most common cause of sickness with about 100,000 documented cases per year. Yet, because new areas, formerly jungle, have been opened up for increased population settlement and because the three countries (Burma, Laos, Kampuchea) which border Thailand have not had effective malaria control projects, malaria continues to be a health problem. (CMP FY1973, p. 27.)

Thailand Malaria Control Project (1962-present)

Collaborating agencies: Peace Corps, Ministry of Public Health, WHO, USAID.

Peace Corps has been active in malaria control programs since 1962. From 1962 to 1972, 135 Volunteers (mostly B.A. generalists) served as assistants to the National Malaria Eradication Project (NMEP). Up to 50 PCVs were working in the project at any one time. During this period, the incidence of malaria fell to one-tenth its previous level.

However, support for the project from various national and international agencies (AID, WHO, SEATO) was withdrawn in the early 1970s. As a result, there was a deterioration of morale and effectiveness of the program and Volunteer numbers dropped. (Project Summary Statement, CMP FY1973, p. 50.)

The Project Summary Statement notes that, in 1973, ten Volunteers assisted in controlling malaria through surveillance, treatment of patients, supervision of sprayers, and problem solving in field operations. Lack of outside support, low morale, and organizational problems in the Ministry of Public Health all contributed to the reduction of Peace Corps participation in the malaria control project to only seven Volunteers in 1974. (CMP FY1975.)

By 1975, with over 300 volunteer-years of service, the malaria eradication program had been the largest and longest-running project in the health sector. Yet, in that year the Peace Corps health program as a whole was down to its lowest numbers ever.

Eight Volunteers were sworn in for the malaria eradication project in 1976, but four terminated within four months. Reasons cited for the high attrition were loosely structured jobs, underutilization, isolation, and inadequate language proficiency. Two of the new Volunteers were assigned to project headquarters to conduct research, participate in entomology projects, and assist with the health education aspect of malaria eradication and control. It was decided that if these new roles were not successful, Peace Corps participation in the malaria program would terminate in July 1977. (CMP FY1976, p. 33.)

At this time, the incidence of malaria was on the increase due to insufficient personnel, supplies, and equipment to control the mosquitoes. Deaths attributable to malaria almost doubled--from 3,437 in 1970 to more than 6,000 in 1976. Controlling the spread of the disease on the village level, particularly in the less-developed foothills or forested areas, was more difficult than in the urban areas. Villagers were resistant to spraying in their homes. (CMP FY1980, p. 29.)

By 1979, the MOPH was convinced of the need to develop malaria control techniques which could be replicated without continued contributions of large sums of money or highly sophisticated equipment. Health and malaria experts from WHO began working with the Malaria Division of MOPH to devise a new control program. WHO provided disease control research, tools, research apparatus, vehicles, scholarships, training fellowships, and short-term experts. USAID supported the program with funding, concentrating in the areas of training, environmental controls, and health education.

The new project (1979-84) emphasized the use of basic vector control techniques, including aquatic plants and fish ponds, which could also serve as a source of additional food and income for farmers. These techniques required no technical knowledge or procedures beyond the capabilities of the local malaria workers and villagers. (CMP FY1981, p. 29.)

Volunteers in the redesigned project were assigned to work in specific problem locations--those with a high incidence of malaria. Their role was to introduce bio-environmental control techniques, upgrade the standards of laboratory services and research on drug-resistant malarial strains and insecticide-resistant mosquitoes, and provide on-the-job training of local personnel. These Volunteers, who usually held a B.A. or B.S. degree, received specific skill-training in malaria control techniques. As the project progressed, Peace Corps found from its experience that success depended on a combination of job skill, flexibility, and cultural adaptation in Volunteers.

Women were professionally involved in the malaria-eradication program for a number of years, mostly as laboratory technicians. In 1979, they began to take on responsibilities as entomologists, with more involvement in decision-making and implementation. Such activities as spraying of DDT had traditionally been done by males, due to the amount of travel and vigorous labor required. However, Thai officials began accepting female Volunteers in such roles. (CMP FY1980, p. 29.) As a result of the outstanding performance of the first female Volunteers, more female Volunteers entered the program and eventually there was more recognition and support for Thai women in similar professional roles. Female workers had the particular advantage of encountering less resistance from village women when house entry was requested for spraying. (Wzorek interview, 1983.)

In 1981 ten Volunteers worked with ten entomology teams to upgrade techniques for identifying transmission patterns, supervised 50 malaria clinics, set up and promoted five demonstration projects including the use of fish for larval control, supervised insecticide spraying in 25 provinces, and conducted two field tests to determine the extent of drug resistance in P. Falciparum (cerebrial malaria). One Volunteer conducted the WHO field test for a new anti-malarial drug. Volunteers trained and supported the work of over 500 field level malaria workers and 3,000 village volunteers in proper malaria control methods. The people of 50 districts were directly or indirectly affected. (CMP FY1982, p. 20.)

In 1983, Malaria Eradication with 11 Volunteers is ranked number six in priority of 21 Peace Corps projects. (CMP FY1984, p. 21.)

Thai Government Support of Peace Corps Projects

Foreign assistance programs, including volunteer services, are controlled by a single agency of the Thai government. The Department of Technical and Economic Cooperation (DTEC), directly under the Office of the Prime Minister, matches national priorities and requests from the people with what volunteer agencies can provide. Project ideas may originate in the village, at provincial headquarters, in a ministry, within DTEC, or with Peace Corps, but to become operational they must have the approval of DTEC. (Geibel Interview, 1983.)

Whatever site is proposed for a project with Volunteer participation, DTEC visits. Needs must be expressed by those at the site. (Ideally, project requests would originate in the village and get to DTEC via the District Head and then the responsible ministry.) The site check includes interviewing the potential PCV supervisor and counterpart. DTEC requires the use of counterparts to encourage the transfer of skills. (Khanobdee Interview, 1983.)

If the requesting ministry cannot provide Volunteer housing, transportation, or per diem, DTEC does. Volunteers are treated as government employees and given a government ID card. Originally, the Thai Government also contributed one million baht to the Peace Corps budget every year. (Of five volunteer agencies active in Thailand, Peace Corps was the only one to receive money from the Thai government.) At present, the government provides a half million baht ($25,000) to Peace Corps to be used to support small, Volunteer-initiated, village-level projects which have been authorized by local government officials. Authority to obligate host country funds rests with the Peace Corps Country Director and does not require Thai government approval. An end-of-year report of expenditures is presented to the Government, which has the right to audit. (CMP FY1980.)

DTEC writes the sections of the National Five Year Plan that describe the use of volunteers in Thailand's development and its budget controls the number of volunteers incountry. According to a DTEC-Peace Corps program officer, large-scale, high-cost development projects have the advantage of providing immediate visible results (dams, roads, hospitals), but volunteer projects provide a greater return for the money with less spent on administration. Thais appreciate Volunteer efforts to learn the Thai language and culture and understand local problems.

The Royal Thai Government stresses the importance of utilizing skilled Volunteers whose training and experience is broader than that of the Thai co-workers whom they train. Since many of the Thai government employees have university degrees, the need is for persons who have more specialized knowledge and experience. The reluctance of the RTG to accept skill-trained Volunteers is a reflection of Thai social and cultural values, which place a heavy emphasis on educational credentials. The credibility of a Volunteer is enhanced if she has a degree in a speciality of the field. This limitation requires that projects be small rather than large, because it is often difficult to recruit sufficient numbers of Volunteers with high level skills whose availability corresponds with PC/Thailand's training dates.

To ensure clear communication of roles and responsibilities in the WRDP, DTEC and Peace Corps in 1981 called a meeting of Volunteer water engineers and their supervisors. New Volunteers, Provincial Deputy Governors, the Director of LAD, the Peace Corps Director, and the APCD were present. Volunteer skills and backgrounds were discussed and previous experiences with PCVs related. Support expected from the Provinces and Bangkok was outlined. (Geibel Interview, 1983.) This definition of relationships and clarification of expectations led to smooth working relations and satisfaction by all parties concerned. Ministry of Interior senior officials frequently travelled to PCV sites, ensuring continued good relations and effective use of Volunteers. (Questionnaires.)

Collaboration

- Peace Corps/Thailand's Water Resource Development Program is largely independent of outside resources.
- In addition to B500,000, the Thai government also provides housing or rent money, vehicles, per diem, project equipment, co-workers, trainers, and technical and administrative assistance.
- The Malaria Eradication Program has received support from USAID, WHO, and UNICEF. The Northeast Integrated Rural Development project is also funded by USAID.
- From 1979 through 1983, Canadian Embassy Mission Administered Funds supported Volunteer projects for a total amount approaching B3.6 million (approximately $160,000). Volunteers contact the Embassy directly to obtain these funds.
- From 1980 through 1983, the Netherlands Embassy's Small Projects Program has provided funds approaching a total of B1.3 million (approximately $57,000). Volunteers contact the Embassy directly.
- The Peace Corps Partnership Program in 1981 and 1982 funded nine projects for a total of $7,935.
- As of February 1983, USAID/Thailand was providing up to $50,000 under the Accelerated Impact Program to support small projects related to rural development initiated and conducted by PCVs under the criteria set by PC/Thailand. (CMP FY1984, p. 31.)

Training

All training of Peace Corps/Thailand Volunteers takes place incountry. All Volunteers receive an average of ten weeks of pre-service training (Thai language, cross-cultural, and technical). Volunteers with grass roots/noneducational assignments receive more language training than PCVs assigned to educational projects. Pre-service language training is based on Silent Way methodology. In-service language training uses Community Language Learning methodology. An ongoing language tutorial program is combined with in-service seminars which last approximately six days (two days for technical training and four days for language). The government of Thailand, through its various ministries, provides technical instructors who also provide cross-cultural training, logistics, and liaison services. Other volunteer agencies train with Peace Corps, because the program is established, successful, and more economical for all involved. (CMP FY1976, p. 28.)

Research in small-scale projects, conducted at Khon Kaen University, is incorporated in Peace Corps training for the Water Resource Development Project by university staff involved in Peace Corps training. This contributes to the success of both training and the project by allowing the use of country-specific technologies and building of Volunteer-Thai communications. (Khanobdee Interview, 1983.)

Pre-service training provides engineer Volunteers with basic technical vocabulary in Thai, familiarization with office working situations and co-worker relationships, a review of engineering skills, familiarization with engineering practices and requirements used in Thailand, and a description of Thai government structure and the Volunteer's role in it.

Communication and Support

Peace Corps/Thailand holds semi-annual program conferences in which Volunteers working in the same program area or the same project gather to exchange experiences regarding their work, to examine their cross-cultural progress regarding adjustment, and to continue language learning. Volunteers find this opportunity to work on local dialects particularly valuable. Conferences are divided into two to three days of technical input and four days of language training. Country-specific technical information is often presented by Thai professors. These conferences have been found to be valuable for information sharing, improving relations with host agencies, providing in-service training, and building Volunteer morale. Volunteers have expressed interest in having conferences more frequently. (Questionnaires.)

Water Resources Development engineers file monthly reports to Peace Corps/Bangkok. Blueprints of all construction are kept on file in the Bangkok Peace Corps office for use by any Volunteers in the future. The engineers produce a newsletter which shares information on any number of relevant issues, e.g. new and old machinery and methods, tips for training workers in development work, development aid for Thailand from internal and external sources, construction facts and figures, and "Words of Wisdom to a Fresh-Off-the-Plane PCV Engineer." (Geibel Interview, 1983.)

Women in Development

Since irrigation projects often provide year-round, domestic water supplies, women are relieved of much of their water-carrying burden. Women as well as men and children are beneficiaries of the irrigation and malaria projects. Since women also usually make up at least 50 percent of the labor in rural development projects, they receive training in construction skills.

Thai women have traditionally not been involved in the planning or decision-making process in these projects. Although Thai women commonly hold management-level positions in many professions, only a very small percentage are involved in the engineering field. Few Thai women study engineering, and those who graduate tend to be professionally limited to drafting and drawing in offices. In the past, requesting agencies have not felt that field work was suitable for women because of traditional cultural attitudes. While there are some cultural constraints to women Volunteers in the field, these Volunteers have been very successful and serve as good role models. Despite initial scepticism on the part of government agencies, female Volunteers are now readily accepted by all departments with which Peace Corps works.

All Volunteers are encouraged to involve women in the process of project planning and implementation. (CMP FY1980, p. 15; CMP FY1983, p. 22.) In 1983, Peace Corps assigned seven female malaria workers and seven female engineers to provincial offices. It was felt that female Volunteers could work more closely with Thai women, who are responsible for household sanitation and who decide whether spraying for malaria will be allowed.

ANALYSIS*

To date, Peace Corps involvement in Thailand related to water and sanitation issues has concentrated very successfully on small irrigation and community water supply projects. Primary efforts have been to increase agricultural productivity and to develop a malaria eradication program.

Aspects Contributing to Project Successes

- From the beginning, Peace Corps irrigation projects focused on the poorest region of Thailand, following the basic human needs policy of Peace Corps.
- Volunteers filled recognized manpower shortages.
- Village cooperation in development projects was easily obtained, demonstrating motivation at the local level.
- Transfer of the Water Resources Development Project from the auspices of the Community Development Department to the Department of Local Administration (LAD) helped decentralize administration and facilitated Volunteers' access to financial and physical resources. LAD was very supportive of Volunteers.
- Recruitment has been appropriate. Engineers have been recruited as Volunteers and given roles with responsibility and technical challenge.
- Goals have been tangible and results often evident within a year. Agricultural production increased for small farm holders from one to two or three crops per year as a result of Peace Corps irrigation projects.
- Year-round domestic water supplies have been provided as a result of irrigation projects, thus improving health for all and relieving women of long-distance water-carrying duties.
- People have been supportive of projects and initiated self-improvement efforts because incomes were increased through the creation of a "cash crop season," construction contracts, employment of construction labor and additional agricultural labor, and production of wind pump parts.
- The fact that only LAD and Peace Corps collaborated in this project has reduced administration and communication problems.

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*By Joseph Gadek and Diana Talbert.

- The training of Thai counterparts has been an integral part of the irrigation programs.

- Peace Corps/Thailand has recently gained the services of a technical advisor for Volunteers. This advisor is a former Volunteer and APCD.

- Eventual redesign of the malaria eradication program to work at local village levels has proven to be beneficial in reducing costs and obtaining the local support required to make the projects successful.

- Female Volunteers have been utilized in the malaria eradication programs which has made contacts with the local households for spraying much easier.

- The Thai Department of Technical and Economic Cooperation (DTEC) has site-checked all Peace Corps proposed posts to assure support and has insisted upon counterpart placements.

- Close cooperation between DTEC and Peace Corps has kept problems from arising.

- The DTEC's role has been beneficial in coordinating all foreign assistance activities in Thailand. Community needs and ministerial and budget support have been assured.

- Language and cultural awareness preparation for Volunteers has helped Volunteers work more effectively on a village level.

- The Royal Thai Government's commitment to Peace Corps programs has also been demonstrated through their annual budget allocation to Peace Corps.

- In-service workshops and conferences for language and technical skill updating, information exchange, and moral support have benefitted Volunteers as well as host country professionals involved.

Aspects Hindering Project Successes

- Poor financial and physical support of early Peace Corps small farmer irrigation projects through the Community Development Department led to Volunteer frustration.

- Long-term results of counterparts replacing Volunteers have not been evident.

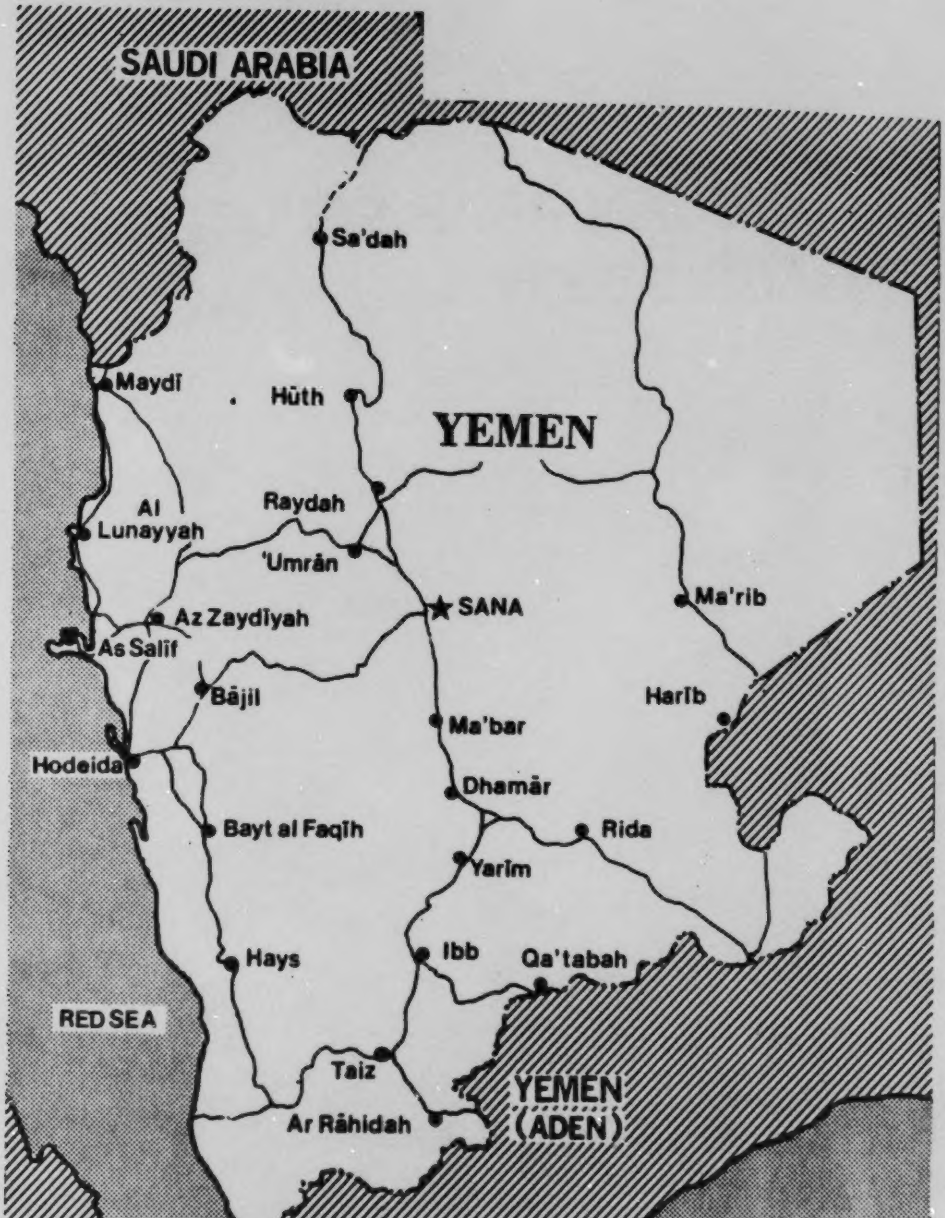
- Rural environmental sanitation and health education components have not been part of the potable water supply projects.

- Volunteers have not generally lived and worked with the beneficiaries of their projects.

- Early setbacks in the malaria-eradication program have been partly attributed to lack of contact by Government and Peace Corps with local people. It had been a top-down project with little or no local participation.

- Initially, women had not been involved in the malaria-eradication program. Once involved and village contacts made, it was observed that the female Peace Corps Volunteers were very successful at extension work, since the household sanitation issues were handled by the women of the households.

YEMEN ARAB REPUBLIC
CASE STUDY AND ANALYSIS


SAUDI ARABIA
Sa'dah
Maydī
Hūth
YEMEN
Al Lunayyah
Raydah
'Umrān
Az Zaydīyah
As Salīf
SANA
Ma'rib
Bājil
Harīb
Ma'bar
Hodeida
Dhamār
Bayt al Faqīh
Rida
Yarīm
Ibb
Qa'tabah
Hays
RED SEA
Taiz
YEMEN (ADEN)
Ar Rāhidah

From The Peace Corps in Yemen, ACTION document 4200.75.

COUNTRY BACKGROUND*

Geography

SAUDI
ARABIA
Red
Sea
YEMEN (S)
Sanaa
DJIBOUTI
Gulf of Aden
Arabian
Sea
ETHIOPIA
SOMALIA
Indian
Ocean

Yemen, a country with an area of 195,000 sq. km (75,000 sq. mi.), is located in the southwestern corner of the Arabian Peninsula, just north of the passage between the Red Sea and the Gulf of Aden. Its neighbors are Saudi Arabia and the People's Democratic Republic of Yemen.

The Tihama, a hot, sandy semi-desert strip about 64 kilometers (40 mi.) wide, separates the Red Sea coast from the generally well-watered mountainous area of the interior. The mountains, heavily terraced for agriculture, reach heights of 3,658 meters (12,000 ft.) above sea level. The normally abundant rainfall and agreeable mountain climate make the interior one of the most important agricultural areas of the Arabian Peninsula. The fabled "Empty Quarter" of Arabia stretches east of the mountains where the border between Saudi Arabia and Yemen has never been defined.

Sanaa, at over 2,134 meters (7,000 ft.) above sea level in the center of the country, is both the capital and principal city, with a population of 250,000. Taiz, at 1,402 meters (4,600 ft.) above sea level, is the principal city of the southern part of the country. Hodeida, at the center of the Red Sea coastal strip, is the principal port.

People

In 1979, the population of Yemen numbered 5.8 million, with an annual growth rate of 2-2.2 percent. The infant mortality rate was 150/1,000 (compared to U.S. 13.8/1,000), and life expectancy was 47 years. Ethnically, the Yemeni are Arabs; their principal language is Arabic, their religion Islam (Shi'a and Sunni).

Twenty-nine percent of the population attend primary school and the literacy rate is 13 percent. The majority of Yemenis live in the small villages and towns scattered throughout the highlands and the Tihama. Only about 10 percent of the population is urban. The work force numbers 1.5 million, of which 55 percent are engaged in agriculture, 4 percent in industry and commerce, 16 percent in services, and 25 percent in emigrant labor.

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*Excerpted from Background Notes, U.S. Department of State, Bureau of Public Affairs, July 1982, and from Peace Corps/Yemen Country Management Plans.

N.B. Special thanks to Lynn Carter, APCD/Y, for much of the information in this case study.

The Physical Quality of Life Index (PQLI)* is 22. The PQLI for NANEAP Region PC countries ranges from 22 to 86; Yemen ranks 12th out of 12.

Though Yemen gained its independence in 1918, the Imams who ruled until 1962 made a conscious decision to keep the country isolated from the rest of the world. Isolation under the Imams was followed by a five-year civil war for control of the successor political structure, so it was not until 1967 that national priorities could be directed toward economic development. (Country Development Review, FY1979, p. 2.)

Under the constitution of 1971, the first nationwide elections took place. An assembly of 159 members was elected as the new legislative body. The assembly subsequently elected the Republican Council, which in turn appointed the Prime Minister, whose cabinet was submitted for a vote of confidence in the assembly.

In June 1974, the constitution was temporarily suspended, and the country was ruled by the Command Council and an appointed Prime Minister and cabinet. This Command Council was abolished in 1977.

Currently, the executive branch is headed by the President. The President is assisted by a 15-member appointed Advisory Council. The President appoints the Prime Minister, who functions as an administrative official, coordinating the activities of the ministries. The President also appoints the Consultative Assembly, the legislative branch. The judicial branch, including religious and civil courts, is administered by the Ministry of Justice.

For administrative purposes, Yemen is divided into ten provinces: Taiz, Ibb, and al Bayda in the south; Marib in the east, Hodeida along the Red Sea coast; Sanaa, Dhamar, and Mahweit in the center of the interior; and Hajja and Sa'dah in the northwest and northeast respectively. Each province is further subdivided into several districts.

The present system accommodates regional and tribal factors. Essentially a tribal society, Yemen has no political parties in the Western sense of the word. In many parts of the country, the government rules by giving sanctions to the traditional local leaders. The tribes have their own system of regulations and proscriptions; violations are settled according to tribal custom in tribal courts. Islamic law (_shari'a_) is administered by Islamic judges who rely on the government for execution of their judgments. In addition to the _shari'a_ courts, there are government-administered civil courts. (Country Development Review, FY1979, p. 2.)

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*The Physical Quality of Life Index (PQLI) was developed by the Overseas Development Council as a non-income measurement that summarizes many aspects of well-being. The PQLI is calculated by averaging indexes on a scale of 0 (the most unfavorable performance in 1950) to 100 (the best performance expected by the end of the century) for infant mortality, life expectancy, and literacy into a single composite index.

Though the government has sought to develop the financial and administrative institutions required for development, the lack of a revenue base has limited its success. Government's role in development is limited to areas it can reach, because of lack of roads, communications, and services. In areas where the government extracts no taxes, posts no civil servants, offers no services, and communicates only via the radio, the phenomenon of a central government is not yet concretely felt.

Given its very low profile in rural areas, the central government has relied heavily on local initiative, participation, and resources for the construction of schools, roads, potable water systems, and the like. An autonomous Local Development Authority (LDA) was created in the early 1970s. Each LDA was financed by local contributions and revenue-sharing with the government, in the form of a percentage of the zakat (a religious duty and one of the five pillars of Islam), a type of income tax paid to the central government. The organizational strategy used at the sub-district local level was essentially a process/broker approach. Operating through the traditional power structure, the government and the LDA promised local residents some financial and technical assistance for projects, if they would put up a certain proportion of the cost themselves. Grass roots local organizations were established, with the assistance of the sheiks, to provide the basic infrastructure. All households were expected to participate in these projects, since they were designed to benefit everyone, not just specific groups. (Yemen Professional Services Omnibus, FY1977, Winter, p. 8.)

Established in 1973, the Confederation of Yemeni Development Associations (CYDA) is an organization of LDAs designed to foster development projects throughout the country by encouraging cooperation and self-help. While not technically a ministry, it functions like one in many ways and is acquiring some prestige and influence in the government. Its chairman also holds the rank of Deputy Prime Minister. The CYDA's job is to coordinate such projects as schools, clinics, mosques, irrigation systems, water supply systems, and roads, relying quite heavily upon foreign assistance funding once a comprehensive plan has been submitted and approved.

Economy

In 1977-78, Yemen's Gross Domestic Product (GDP) was $2.7 billion, with an annual growth rate of nine percent (1977) and an inflation rate of 30 percent. Per capita income (1977-78) was $475.

Agricultural products--wheat, sorghum, fruits, coffee, cotton, and cattle and sheep--provide 35 percent of Yemen's GDP. Industrial development is still in its early stages; important products are cement, textiles, and basic consumer goods. In 1966, an Egyptian team carried out explorations for minerals; traces of copper, sulfur, coal, and quartz were found. These natural resources have yet to be exploited.

Although its climate and topography permit a wide variety of crops, Yemen, once self-sufficient in food, has become dependent on food imports. The disruptions of civil war (in 1965-66) and a prolonged drought (until 1973) dealt a severe blow to its previously prosperous agriculture. Coffee production, formerly Yemen's main export and principal source of foreign exchange, has fallen. In 1978, Yemen exported goods worth $7.1 million, mainly coffee, cotton, hides, and skins.

The low level of domestic output of building materials and foodstuffs and the lack of raw materials, machinery, and hardware production make Yemen dependent on imports for essential needs. In 1978, Yemen imported goods worth $834 million, primarily in manufactured goods, oil products, and textiles. Trade deficits are made up by remittances from Yemenis working abroad (over one million in Saudi Arabia alone) and foreign aid.

Yemen's location next to Saudi Arabia and to the other oil-rich Gulf States also has a profound influence on the state of Yemeni development. The proximity provides a market for Yemeni labor, with an estimated 1.2 million working in Saudi Arabia and the Gulf States. Resulting workers' remittances represent a significant source of national income, but the phenomenon drains much of Yemen's productive manpower. The combination of manpower shortage and competitive employment in jobs across the border means there is no available supply of cheap labor on which to build industry, agriculture, and services. (Country Development Review, FY1979, p. 2.)

The Soviet Union and the People's Republic of China (RPC) have provided large-scale assistance to Yemen, beginning in the mid-1950s. Among the most important projects undertaken by these nations are construction of a modern port at Hodeida, paved roads from Hodeida to Sanaa and from Hodeida to Taiz, and a civil airfield and large weaving mill at Sanaa. Several hundred Yemeni youth have received scholarships for study in these countries.

In 1971, the government adopted a completely open-door foreign assistance policy. Moderate progress in development to date reflects this short period of activity.

Saudi Arabia has become Yemen's principal aid donor in recent years, providing direct financial assistance (over $250 million in 1978) and project aid. Other donors are Kuwait, the United Arab Emirates, the RPC, the Soviet Union, the World Bank, the UN Development Program (UNDP), Iraq, the German Democratic Republic, the Federal Republic of Germany, and the United States.

Among projects undertaken by the United States are construction of a road from the southern border and the port of Mocha through Taiz to Sanaa; installation of a public water system at Taiz; and a series of rural development projects. In addition, under PL 480 (Food for Peace), the United States has provided surplus food for famine relief.

Water/Sanitation

In Yemen, the early rains (April to May) and the late rains (August to September) support farming throughout most of the country. However, the steep terrain causes heavy run-off and poses a continuous threat of flooding and erosion. The billions of gallons of water that fall in annual rains rush off the slopes to disappear under the sands of the west, east, or south. Not a single river or stream reaches the Red Sea above ground. There is no continuously flowing river with which to carry out irrigation, to develop hydroelectric power, or to serve industrial or mining needs. (Country Development Review, FY1979, p. 1.)

Though aquifers have become the primary source of water in the last decade, the rugged terrain hampers the exploitation of underground water. Because few roads exist in rural areas and new roads are expensive to build and maintain, it is difficult to move drilling rigs. The Country Development Review notes that volcanic geology requires the use of cumbersome and expensive rotary drill rigs to dig wells. This geology also yields little subterranean water.

In addition, due to uncontrolled development of wells, ground water supplies which existed in considerable reserves are decreasing at an alarming rate. Around the capital, for example, the water table is sinking by two meters a year. This decrease may eventually have particularly serious results along the coastal plain, where salt water could begin to replace the fresh. (Carter, May 1983, p. 2.)

At most, eight to ten percent of the rural people have easy access to safe water. Most villages depend on hand-dug wells which are inadequate, undependable, and liable to contamination. In rural areas, sanitation levels are precariously maintained. (WHO Water Sector Digest, Yemen, 1979.)

During the rainy season, which lasts for only 26 days in some areas, water is collected and stored in open reservoirs and taken from flooded river beds. At other times, it is drawn from deep, hand-dug wells, often far from villages. This puts a heavy burden on women and children who must frequently walk as far as ten miles to fetch supplies. It would not be an exaggeration to estimate that one-quarter of women's waking hours are consumed collecting water.

Inadequate water supply and the related problems of open reservoirs and poor personal and food hygiene are among the main causes of the country's major diseases--schistosomiasis, tuberculosis, malaria, gastroenteritis, amoebic dysentery, and infectious hepatitis. (Country Development Review, FY1979, p. 10.)

Sanaa, the capital city, has in recent years developed a municipal water system, but many houses still rely on private wells. The National Water and Sewage Authority (NWSA) has also begun to install a sewer system for waste disposal. The Taiz municipal water and sewage systems, which USAID helped to develop, give broader coverage at present than the Sanaa system. Hodeida, the third major city in North Yemen, is also in the process of installing a water and sewage system. (Carter, August 1983.)

Entering the 1980s, the World Bank was funding a complete water and sewage system for Sanaa, USAID was expanding the Taiz water and sewage system, and the German government was building a sewage treatment plant for Hodeida. The Saudi Arabian government funded a Japanese team to drill a number of wells for rural communities. A private British company was doing some drilling, UNICEF was contributing piping for rural potable water projects, and USAID had begun a major program, including well-drilling and small water projects with the Ministry of Public Works. (Country Development Review, FY1979, p. 11.)

Implementing Agencies

It has proven impossible thus far to develop a national policy on water. One important reason is that two kinds of law, tribal ('urf) and Islamic (shari'a), can be applied to questions of water ownership and use. The two laws differ, and there can be serious questions about which law to follow in a given case. Although shari'a provides the country with its formal legal code and is followed in cities and towns, 'urf generally prevails throughout the countryside, particularly in the north and east.

In addition, there is no single water authority. Responsibility is shared by a number of government ministries and agencies, such as the Ministry of Public Works, the Confederation of Yemeni Development Associations, the National Water and Sewerage Authority, the National Council on Water, and others. The jurisdictions of all of these organizations overlap to a certain extent. (Carter, May 1983, p. 2.)

Finally, the Rural Water Supply Division of the Ministry of Public Works, which is responsible for rural water projects, does not have the professional manpower or financial and administrative capacity to effectively carry out large-scale projects. Drilling conditions are difficult and expensive. The price of cement and other materials is high, and their quality is poor. Thus, the Division is severely limited in its ability to implement a water policy. (Country Development Review, FY1979, p. 11.)

The Confederation of Yemeni Development Associations also helps Local Development Associations construct small rural water projects. As an organization, it has many of the same problems that the Rural Water Supply Department has.

OVERVIEW OF CASE STUDY PROJECTS INVOLVING WATER/SANITATION*

Name	Year(s)	Goals/Activities	Size**
Haima Small Dams Project	1974-75	PCVs improved irrigation system to boost coffee-growing capability.	Small
Rural Water Supply/Well Drilling/Small Water Projects 022	1973-78	Project goals were to provide supply of ground water to villages and train Yemeni counterparts to operate and maintain drilling rigs and village water systems.	Small
Construction Design and Engineering	1978	PCVs constructed water-storage tanks, provided technical expertise in design and construction of public projects: buildings, streets, parks, water and sewage systems.	Medium
Rural Health Clinics	1978-81	PCVs provided health and sanitation education, encouraged self-help projects, cleaned water supplies and cisterns.	Medium
Rural Development/ Small Water Projects 044	1981-present	Project designed to provide sources of safe, potable water. PCVs construct spring boxes and elevated water tanks with gravity-feed distribution systems, train counterparts, maintain water systems, and educate about water-borne diseases. In some instances, the new technology of shotcrete has been used in the construction of water tanks.	Medium
Local Resources for Development 045	1980-present	PCVs plan, design, and construct water projects, schools, and clinic housing; test appropriate technologies; and conduct a wide range of training projects.	Medium
CRS Small Rural Water Projects	1983-present	One PCV functions as a project officer in charge of the planning and implementation of water projects.	Small

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*This information is taken from Phase I, the Survey of Peace Corps Water and Sanitation Activities from 1970 through 1982.

**Project size is indicated as follows: "Small" represents under 5 Volunteers; "Medium," 6-12; "Large," 13 or more. Number of Volunteers varied from year to year, therefore this label indicates an average.

TIMELINE OF SIGNIFICANT EVENTS COVERED IN THE YEMEN CASE STUDY

USAID 022 Rural Water Supply Project starts up	1973	Peace Corps entry
	1974	Haima Small Dams Project begins
PCVs join Project 022	1975	Haima Small Dams Project ends
	1978	Mahweit Integrated Rural Development Project starts
Project 022 ends		
	1980	Project 045, Local Resources for Development starts YARG-Chemonics-USAID-PC
Project 044 Small Water Projects starts YARG-TransCentury-USAID-PC	1981	
Mahweit Project ends		
Peace Corps participation in YARG-CRS Small Rural Water Projects	1983	

HISTORY OF PEACE CORPS WATER/SANITATION ACTIVITIES

Eighty-nine percent of Yemenis live in villages of less than 2,000 people. Of the occupied dwellings in Yemen, 91 percent are without piped water. Yemen has a 13 percent literacy rate (two percent among women), a PQLI of 22, and the highest infant mortality rate of Peace Corps countries in NANEAP (16 percent). Considered a "least developed country" by the United Nations, Yemen is a prime candidate for involvement of Peace Corps. Peace Corps began working in Yemen in 1973.

Peace Corps/Y struggled for nearly ten years to develop a water project it considered successful. A new government with a growing infrastructure, traditional community politics, lack of counterparts until 1981, inconsistent skill-training of Volunteers, and Volunteer placement prior to project start-up all contributed to frustration in several projects.

Project success finally resulted from continuity of staffing, credentialed project staff who were familiar with the culture and spoke the local language, and having the right people in the right place at the right time in the planning stages.

PC/Y established the first model for project collaboration involving U.S. private enterprise as a key member.

Haima Small Dams Project (1974-75)

Collaborating Agencies:* Peace Corps, Confederation of Yemeni Development
Associations (CYDA), Catholic Relief Services (CRS),
Local Development Authorities (LDAs), OXFAM

Peace Corps' first venture into the area of water projects began in late 1974 with the Haima Small Dams Project. Haima is an important coffee-growing region of Yemen (the Yemeni port of Mocha lends its name to this famous coffee), and the project was designed to increase production. The primary goals were to provide the farmers of the Haima region (off the Sanaa-Hodeida road) with a new, dependable supply of irrigation water; and to improve their irrigation practices in order to increase coffee production, improve the cultivation practices of secondary crops (sorghum, wheat, barley, corn), and introduce crops that were new to the area (alfalfa, vegetables). (Carter, May 1983, p. 2.)

Ten years of drought had reduced agricultural production and forced some farmers to go abroad for employment, others to switch from growing coffee to qat (a plant with leaves chewed as stimulant), and still others to cut down their coffee trees to sell as firewood to provide for their families. These farmers asked their Local Development Association (LDA) (see page 43) for assistance in developing the water resources of the area. The LDA, in turn, solicited the aid of the Confederation of Yemeni Development Associations (CYDA) (see page 43). CYDA asked both Peace Corps and Catholic Relief Services for help. A Peace Corps couple, an engineer and a nurse, performed a feasibility study and a brief socioeconomic survey. In March 1974, the Confederation, the Central Planning Organization (CPO), Peace Corps, and Catholic Relief Services (CRS) agreed to cooperate in developing the water resources of the area. (Haima Small Dam Project Description, 1974, p. 2.)

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*Agencies may collaborate on projects in a number of ways: funding, such as by the World Bank, EEC, USAID; in a cooperative effort such as with CARE, CRS, CUSO; or as part of a signed agreement such as with TransCentury Foundation or a Ministry of Health.

The plan was for Volunteers to assist the farmers to build small earth-fill dams in eight to ten project wadis (dry river beds) which would allow the river beds to fill up during the summer rainy season and thus provide a supply of irrigation water for the dry season. The dams were to be built from rock and earth with only small amounts of cement and steel. These materials were to be provided by the farmers themselves. Volunteers were to supervise the local farmers who would receive food-for-work through the CRS/USAID program.

Generalist Volunteers were to be skill-trained as construction supervisors. In addition, three PCV hydraulic engineers, an irrigation specialist, and a hydrogeologist participated. No plans were made for counterparts.

The hydrogeologist was to study the watershed and, with an engineer and the local leaders, select the best dam site in each wadi, determine the type and size of dam needed, and estimate the amount of water to be produced. The engineers would design the dam and irrigation channels, do the required surveying, and lay out the construction stakes. Construction Volunteers would be stationed permanently at each site to supervise the actual construction. The engineers would be responsible for the dam sites and would visit each site regularly in order to advise the construction Volunteers.

The irrigation specialist would study the amount of land to be irrigated and the amount of water needed for the crops grown. He would consult with the engineers and the local leaders to determine the size and number of outlets needed from the dam, etc. He would also prepare and supervise the demonstration on improved irrigation techniques.

The construction supervisor would assist the specialists in their initial surveys, work with the local Sheik to organize and coordinate the workers, supervise the dam and water-channel construction, work with the farmers on their water-management practices, coffee-cultivation practices, and introduction of new crops. He would be supported by the Sheiks, the Volunteer specialists, and the resident UNFAO coffee expert.

But, when 18 Volunteers arrived in October 1974 for training, no funding had as yet been obtained. No preliminary technical feasibility studies had been done and no sites for dams designated. In fact, Volunteers in the project appeared not to have had access to any senior technical experts. When the Volunteers began work, they soon realized that there was only one optimal site for a dam in the entire area. Therefore, the idea of building dams was abandoned and Volunteers turned their attention to the irrigation system as it existed. (Carter, May 1983, p. 3.)

Three areas in the region that had enough water and coffee to justify assistance were surveyed. The PCVs then designed three projects for improving existing retaining dams and water delivery systems and presented them to OXFAM for funding. OXFAM approved the projects, but shortly thereafter the paramount Sheik and head of the Haima Local Development Association, who had been helping and supporting the Volunteers, was replaced. His successor favored projects in his own area. Unfortunately, none of the approved three sites was in his area and so the project finally collapsed.

By this time, about half the Volunteers involved had already terminated and others had transferred to other projects, not necessarily in the water sector. One Haima Project PCV transferred to a USAID Geological Survey Project and others transferred to Project 022, Drilling Wells. Only two Volunteers saw the project through to its end in 1975. These two completed their Peace Corps service by working on a Yemen-wide water survey for CYDA. They then had one small water project approved, funded by OXFAM, and built.

Rural Water Supply Project (Well-Drilling/Small Water Projects), Project 022* (1973-78)

Collaborating Agencies: Peace Corps, the Rural Water Supply Department (RWSD) of the Ministry of Public Works, the Central Planning Organization (CPO), USAID.

USAID's Rural Water Supply Project was begun in 1973, also in response to the economic impact caused by ten years of severe droughts. As cited in the project plan (Rural Water Supply Project Description, 1974), the goals of the project were:

- to improve the living conditions, health standards and economic possibilities of project villages by providing a supply of potable drinking water and, if possible, a supply of irrigation water; and

- to strengthen the Yemen Government's Rural Water Supply program by training Yemeni counterparts to operate and maintain drilling rigs and village water systems.

This project evolved from previous USAID water projects. In 1965, USAID/Yemen began a program of community self-help projects. By 1967, over 150 self-help projects in the areas of water supply, farm-to-market roads, and training in water-supply techniques had been undertaken. In 1967, U.S./Yemen diplomatic relations were broken, and the USAID mission left Yemen. The self-help projects had been in operation long enough, however, to have achieved the following (Rural Water Supply Project Description, 1974):

- local organization and a spirit of cooperation in participating villages;

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*Projects in Yemen are frequently referred to by the final three digits of their USAID project number.

- roads to previously inaccessible villages;
- Yemenis trained in operation and maintenance of water systems; and
- Ministry of Public Health training programs established in water sanitation and health education.

When the USAID mission reopened in Yemen in 1973, the Rural Water Supply Project was one of the first to receive the attention and approval of both the Yemen and U.S. Governments.

Well-Drilling Projects

Well-drilling projects usually involved development of water systems based on deep-drilled wells with a storage tank and distribution system to support one large village or a group of small villages. Drilling wells in Yemen, largely through basalt formations, is an expensive, time-consuming operation requiring heavy equipment. (Professional Services Project Description, FY1977, p. 9.) The government of Abu Dhabi purchased seven Ingersoll-Rand T-4 Drillmaster drilling rigs for the Yemen government, four of which were turned over to USAID for the project.

The Peace Corps was requested to assist in the project by providing well drillers to train Yemeni crews in the operation and maintenance of the rigs and mechanics to train counterparts to install, operate, and maintain the village water systems. At least two PCVs transferred to 022 from the Haima Project in 1975. In addition, two well drillers, one engineer, and one construction supervisor were recruited by PC/Y.

USAID provided technical backstopping--an engineer, an equipment specialist, and a well driller; supplies; transportation; a vocational-training program; and food-for-work for villagers who participated in village projects.

Small Water Projects

Small water projects operated under the auspices of a Joint Committee composed of USAID's project manager, USAID's program officer, the Director of the Rural Water Supply Division of the Ministry of Public Works, the Deputy Director of the Central Planning Organization (CPO), and the Director of Peace Corps or any of their designees.

The objectives of the small water projects were to do what could be done to help rural communities improve their traditional potable water systems. In some cases, this assistance involved improving an existing spring, improving a hand-dug well, piping water to prevent evaporation and seepage loss, or constructing large, open cisterns for trapping rainwater. Sometimes water systems had been in constant use for literally centuries. In other cases, water systems that may have been used in Himyaritic times (115 B.C. to 525 A.D.) had fallen into disrepair and disuse. (Professional Services, FY1977, p. 9.)

Volunteer coordinators and construction supervisors were recruited to assist in the design and estimates of cost, labor, and materials, as well as to supervise this work. One Volunteer reported constructing stone tanks holding approximately 6,000 to 12,000 gallons of water; installing pipelines from wells to the tanks (averaging one-half kilometer distant); constructing cisterns to collect run-off water from surrounding hills and mountains; and building above-ground masonry tanks to store water delivered via pipe from a machine-drilled well. (Questionnaire.)

Volunteers were assigned directly to the Rural Water Supply Division of the Ministry of Public Works and were dependent on Yemeni supervisors to arrange and schedule their work. Since in the 1970s the entire ministerial system was rather new in Yemen, sufficient manpower and experienced management to provide this supervision were lacking. Because Volunteers felt themselves to be ineffective and underutilized, morale was low, and the PCVs viewed the RWSD as unsupportive. The Yemeni Government (YARG) was not pleased with how little the PCVs had to show for their work. Peace Corps-Ministry relations became strained. (CMP, FY1980.)

By 1978, six villages had completed potable water projects. Villagers had received education about water-borne diseases, and were trained in water system maintenance. By 1979, 11 Peace Corps Volunteers had served in this project.

Mahweit Integrated Rural Development Project, 1978-81

Collaborating Agencies: Peace Corps, CYDA, Save the Children Federation (SCF), USAID.

The purpose of the project, funded by an operational program grant from USAID, was to stimulate community participation in rural development activities in Mahweit Province. Villagers' needs were expressed through Village Committees. The people served were in the town of Mahweit, with a population around 5,000, and the surrounding villages of fewer than 200 people each.

The project focused particularly on developing the skills of women in the areas of water and health. In 1978, a health center was opened by Save the Children Federation (SCF) to provide preventive health care for children under five. The center was staffed by SCF personnel, Yemenis, and Peace Corps Volunteers. Most of the clinic's clients were women and children.

In the first year of the project, the clinic supported an immunization program, which a female PCV managed. The clinic also maintained a health education program (nutrition, sanitation, hygiene) for the mothers with their children. A Peace Corps Volunteer worked in this program with an SCF nutritionist who had lived several years in Yemen. Clinic workers, including a PCV nurse, helped to update the pediatrics section of the local hospital. In the second year, the clinic supported a mobile unit for the immunization and health education activities (Obermeyer Interview, 1983).

Other activities included literacy training, sewing, and a small poultry raising project. A demonstration garden project was set up at the clinic and in other gardens around Mahweit. Clinic staff worked with women who had gardens at their homes teaching water recycling techniques. No PCVs were involved in these activities.

Another component of the Mahweit project involved water resources. Activities included spring-capping in the villages and water catchment and storage and spring improvement in Mahweit town. A PCV engineer assisted the SCF engineer in this area.

The Mahweit Integrated Rural Development Project was phased out early for a number of reasons. SCF was able to recruit four Yemeni field coordinators only after the project had already been underway for two years. During this time, the project's activities developed an expatriate character which contributed to communication problems (Gustman, 1981).

According to the USAID Special Evaluation Report, July 1980, SCF's philosophy of a community-based, integrated rural development project was not viable in a province that lacked the required features of social homogeneity, common goals, and egalitarian ideals and institutions. The project's first effort, a youth center, had allied the project with one local faction. The evaluation states that, in this highly divided community, further disputes arose over programs for women, road projects which crossed private land, and water projects.

In 1980, the Governor, under local pressure, demanded that the project entirely finance a Mahweit sewer system. When SCF found this beyond the project's means and scope, the community demanded the project's withdrawal. SCF closed the clinic. SCF was then given the option of keeping the clinic, but withdrawing the agriculture and water activities. SCF declined the option and the project was phased out entirely in late 1981.

Small Water Projects, Project 044 (1981-84)

Collaborating Agencies: Peace Corps, Ministry of Public Works, New TransCentury Foundation, USAID

In 1976, the Peace Corps Director, in collaboration with YARG, concluded that a new framework was necessary to best utilize Peace Corps Volunteer skills and energy in Yemen. This conclusion was based on Yemen's many needs, the inadequate supportive capacity of the understaffed Yemen ministerial structure, the rapidly declining credibility of Peace Corps in Yemen, the socioeconomic/cultural/political structure of the rural areas, and the history of Peace Corps projects. The solution devised was to combine Peace Corps manpower with USAID financial resources and a PVO contractor with technical expertise and management skills (Garner Interview, 1983).

The Peace Corps Director and the USAID Director worked together to plant the seeds for projects which eventually became the CRS Primary Health Program, 044 Small Water Projects, and 045 Local Resources for Development (Garner interview, 1983).

Meanwhile, in 1977, AID Washington (AID/W) contacted various qualified PVOs via Private Agencies Collaborating Together (PACT) to compete for an Operational Program Grant. A representative of the New TransCentury Foundation visited Yemen at USAID expense to investigate a possible project building rural water systems. TransCentury began to work with the Peace Corps Director, USAID/Y, and the Rural Water Supply Department (RWSD), Ministry of Public Works to include PCV engineers, architects, and construction supervisors in the project. The job descriptions were drawn up in discussions and negotiations with the Ministry of Public Works, Peace Corps/Yemen, New Transcentury, PC/W, and USAID.

According to David Garner of New TransCentury, although negotiations with the Ministry began in 1978, the final document for the project was not signed until January 1981 (two Peace Corps and three USAID Mission Directors later). There were several reasons for the delay. First, this new type of relationship required time to "work out." Secondly, USAID documentation requirements were, as usual, long and complex; and finally, the Ministry was uncertain about becoming involved with Peace Corps programs again.

In addition, negotiations were delayed because the necessary ingredients for successfully starting and following through with a project are the right people in the right place at the right time--all willing and able to spend the time necessary to establish a consensus. Personalities and politics in USAID/Yemen, the YARG Cabinet, the Ministry, and the U.S. Embassy in 1977 and 1978 contributed to the delays and hesitation in signing a binding agreement.

Three working documents were required to finalize the agreement. After the Basic Agreement between USAID/Yemen and the Ministry of Public Works was signed in late 1979, Peace Corps recruited five Volunteers for 044. Within two days of the signing of the second document in July 1980 (the Cooperative Agreement between the New TransCentury Foundation and AID/W), TransCentury's core field staff was in place. However, the third and final document, the Letter of Understanding between New TransCentury, the Ministry of Public Works, and The Central Planning Office, which was to have been signed within 60 days of the second document, was not signed until six months later. (Garner Interview, 1983.)

As the delays stretched on, the PCVs recruited in 1979 worked in the interim under a USAID-funded Limited Scope Grant Agreement (funding: $144,000) assigned directly to the Rural Water Supply Department of the Ministry of Public Works. While initially there appears to have been adequate work within the Ministry, the Department seems to have eventually run low on funds and was unable to keep the Volunteers fully employed. The Volunteers were without vehicles and adequate supervision. Discontent grew, and in 1980 two PCVs were asked to leave Yemen by the Ministry. One Volunteer had terminated prior to this time, and the remaining two were granted early COSs in late 1980. Because of the Ministry's problems in dealing with these Volunteers, Peace Corps' reputation in the Ministry's eyes reached a nadir in mid-1980. (Carter, May 1983, p. 5.)

There had been no field construction authorized by the Ministry from the time New TransCentury staff arrived in August 1980 until the final document was signed in January 1981. Following the signing, the process of institution building began. Five Yemenis were recruited and given on-the-job training in construction and survey techniques. These men would eventually become the counterparts of Volunteers. The average Yemeni recruited was 18 to 19 years old with a sixth to eighth grade education, held no driver's license, and was numerate and somewhat literate in Arabic. Most spoke no English. (Garner Interview, 1983.)

According to APCD Carter, PC/Washington did its best to recruit well-skilled professionals for this project because of YARG's emphasis on good credentials. Project 044 was undoubtedly given some priority in recruitment by PC/Yemen and PC/Washington during the first year of start-up because Peace Corps had such a poor reputation with the Ministry at that time. It was essential to change the Ministry's attitude toward Peace Corps and to ensure Ministry acceptance of candidates. A special recruitment effort, funded by TransCentury and coordinated by PC/W Placement, was launched in late spring 1981. On a TransCentury consultancy, a former Yemen water project Volunteer screened potential recruits in the United States, discussed the opportunities and constraints of Peace Corps water projects in Yemen, and was able to recruit five excellent Volunteers to enter the summer training cycle. (Carter, p. 8.)

Carter goes on to describe the PCVs in this project. The new recruits and the other Volunteers assigned to this project were generally in their twenties. As a group, the architects and engineers tended to be recent university graduates without much professional experience, while the construction supervisors were usually a little older with good construction experience and skills.

During pre-service training, all Volunteers spent one week on site visits. During this week, TransCentury provided on-the-job training in field survey and design, field construction and supervision, and project administration. Each PCV did all three jobs, specializing in one. In addition, each Volunteer received approximately 280 hours of colloquial Yemeni and literary Arabic, as well as 90 hours of cultural and development studies. Only two Volunteers out of the total of 14 who have been assigned to this project have received specialized technical training. Both participated in water/sanitation Stateside Training (SST) programs.

In March 1981, the first Volunteer was assigned to the functioning Project 044. He was a construction supervisor originally recruited for Oman but reassigned to Yemen.

Carter notes that in September 1981, two architects, one engineer, and two construction supervisors completed their training incountry and were assigned to 044. Two more PCV engineers and one construction supervisor were added to the project in January 1982. The following September, an additional construction supervisor was assigned to the project. He, however, was dissatisfied and was transferred to another project in March 1983. In late March 1983, two new PCV engineers and two architects began working with 044. The project now (August 1983) has 12 Volunteers: five engineers, four architects, three construction supervisors. Because of a measure of interchangeability in their jobs in Yemen, PC recruits architects, engineers, and construction supervisors for the project, with an attempt to keep a balance between the three occupations.

Specific Volunteer levels for the project are determined by budget, vehicles, number of management staff, number of counterparts, and the need for survey and design capability. Peace Corps has agreed, in conversation with the Ministry and TransCentury, to maintain the Volunteer level between 12 and 15 individuals. As of August 1983, PC/Y had nine 044 PCVs in training: two engineers, two architects, and five construction supervisors. These Volunteers replace five scheduled to COS in September 1983 and three in January 1984. In January 1984 there were to be 13 PCVs in the project.

Volunteers are based in Sanaa, headquarters of the project. All Volunteers spend some time working in the central office. One PCV, a field construction coordinator, is based in the central office to serve the needs of Volunteers working in the field. Most of the other Volunteers spend 50 to 60 percent of their time working at project sites. The project has rented two houses in the Tihama because it is difficult for villagers there to provide housing. Some Volunteers, if their work site is far from the two houses, prefer to remain in the village and sleep in tents. (Carter, May 1983, p. 7.)

The Volunteers work under the supervision of and in conjunction with TransCentury salaried staff. All TransCentury staff have strong training skills and positive attitudes toward Yemen which have helped to build the project. The team leader is an Afghan civil engineer and former Deputy Minister who had worked with Peace Corps Volunteers in Afghanistan. Two TransCentury staff members are former Yemen PCVs: one who has been working on Peace Corps water projects since 1974 and one civil engineer with five years in Yemen and fluency in Yemeni Arabic. Two other staff members were Irish volunteers in Yemen. One former staff member was an Algerian woman, a soils mechanical engineer/hydrologist whose Muslim culture and five years experience in Yemen strengthened the project. (Garner Interview, 1983.)

Staff-Volunteer relations are excellent, and Volunteers seem to have encountered no morale problems in working alongside paid staff. This can be explained, in part, by the fact that Volunteers have had considerable independence of action and great responsibility for the completion of individual water projects. Volunteers have worked closely, usually in a one-to-one relationship, with Yemeni counterparts. Counterpart training has been an important aspect of Project 044, which now has 19 Yemeni counterparts, or more than one per Volunteer. As of August 1983, two counterparts were sufficiently trained to work on projects without Volunteer supervision. In addition to training formal counterparts, Volunteers have trained villagers in pump and water system maintenance and repair. (Carter, May 1983, p. 6.)

According to Carter (p. 6), individual projects are chosen and assigned to Project 044 by the Ministry of Public Works. Because many villages need and want water projects, the competition to be designated a recipient is keen. USAID and TransCentury have established technical criteria for the selection of projects. After a village has been proposed by the Ministry, an 044 team will visit it to determine the technical feasibility of installing a water project. For example, the team will typically run a well test to determine the well's ability to provide an adequate amount of water for a distribution system. Since water consumption increases when water is piped to houses, calculations must be done to determine how much water will be needed and how much the well can provide. Some villages simply do not have enough water to justify the expense and labor of a project.

Volunteers and Yemenis alike are highly pleased with the projects which bring water systems to small villages for the first time. For example, Project 044, with three PCVs, worked in a relatively remote, poor area constructing a spring box, storage tank, and pipe systems in three small villages, one of which has a population of about 150 people. These villages would not have even a rudimentary water system without this project. Both PCVs and Yemenis perceive this. (Dichter, 1982.)

Additionally, says Carter, projects have varied greatly in their level of technical difficulty and in the time needed for completion. Projects in the Tihama, the flat coastal plain, usually require elevated, reinforced concrete storage towers, to which water is pumped from a well. Mountainous areas in the central part of the country require smaller and less complex projects, relying on small catchment tanks or springs and gravity-fed distribution systems. One spring source, 300 meters below and two kilometers distant from the village being served, uses two 16-stage electric pumps.

When possible, almost all distribution systems are arranged to allow the villagers to connect their houses to a primary piping system that runs through their village. Public taps--four to six sets per village--are also installed. The project staff has recently begun planting fruit trees around these taps in order to use run-off water.

During site construction, subcontractors are taught improved techniques, counterparts learn construction supervision, and villagers are trained to construct, operate, and maintain the water systems. Generally two villagers are selected from each village for a short course in pump and diesel mechanics/maintenance conducted under Ministry auspices in Sanaa. (Garner Interview, 1983.)

Individual projects are funded largely by USAID with input from villagers in the form of labor and provision of local building materials such as stone. In these ways, villagers typically fund 30 to 50 percent of the direct cost of the project. For each village approved for a water project, a contract is signed by a village representative, the Ministry of Public Works, TransCentury, and usually a representative of the Local Development Authority or the Governor's Office. The Ministry of Public Works funds salaries for the ten counterparts it assigns to the project. It also provides office space for the project, administrative support, and liaison with the villages. (Carter, May 1983, p. 7.)

The Carter report states that project funding and materials supply have been adequate. TransCentury has been responsible for both domestic and international procurement.

The project in recent months acquired two sets of shotcrete equipment in order to experiment with this method of constructing water tanks. Generally, water storage tanks are built from stone. In certain instances, however, shotcrete may be both faster and cheaper than the traditional use of masonry or forms for concrete. The shotcrete technique, though relatively expensive and "high-tech," appears to be appropriate for Yemen with its capital-intensive approach to development assistance.

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The Volunteers work under the supervision of and in conjunction with TransCentury salaried staff. All TransCentury staff have strong training skills and positive attitudes toward Yemen which have helped to build the project. The team leader is an Afghan civil engineer and former Deputy Minister who had worked with Peace Corps Volunteers in Afghanistan. Two TransCentury staff members are former Yemen PCVs: one who has been working on Peace Corps water projects since 1974 and one civil engineer with five years in Yemen and fluency in Yemeni Arabic. Two other staff members were Irish volunteers in Yemen. One former staff member was an Algerian woman, a soils mechanical engineer/hydrologist whose Muslim culture and five years experience in Yemen strengthened the project. (Garner Interview, 1983.)

Staff-Volunteer relations are excellent, and Volunteers seem to have encountered no morale problems in working alongside paid staff. This can be explained, in part, by the fact that Volunteers have had considerable independence of action and great responsibility for the completion of individual water projects. Volunteers have worked closely, usually in a one-to-one relationship, with Yemeni counterparts. Counterpart training has been an important aspect of Project 044, which now has 19 Yemeni counterparts, or more than one per Volunteer. As of August 1983, two counterparts were sufficiently trained to work on projects without Volunteer supervision. In addition to training formal counterparts, Volunteers have trained villagers in pump and water system maintenance and repair. (Carter, May 1983, p. 6.)

According to Carter (p. 6), individual projects are chosen and assigned to Project 044 by the Ministry of Public Works. Because many villages need and want water projects, the competition to be designated a recipient is keen. USAID and TransCentury have established technical criteria for the selection of projects. After a village has been proposed by the Ministry, an 044 team will visit it to determine the technical feasibility of installing a water project. For example, the team will typically run a well test to determine the well's ability to provide an adequate amount of water for a distribution system. Since water consumption increases when water is piped to houses, calculations must be done to determine how much water will be needed and how much the well can provide. Some villages simply do not have enough water to justify the expense and labor of a project.

Volunteers and Yemenis alike are highly pleased with the projects which bring water systems to small villages for the first time. For example, Project 044, with three PCVs, worked in a relatively remote, poor area constructing a spring box, storage tank, and pipe systems in three small villages, one of which has a population of about 150 people. These villages would not have even a rudimentary water system without this project. Both PCVs and Yemenis perceive this. (Dichter, 1982.)

Additionally, says Carter, projects have varied greatly in their level of technical difficulty and in the time needed for completion. Projects in the Tihama, the flat coastal plain, usually require elevated, reinforced concrete storage towers, to which water is pumped from a well. Mountainous areas in the central part of the country require smaller and less complex projects, relying on small catchment tanks or springs and gravity-fed distribution systems. One spring source, 300 meters below and two kilometers distant from the village being served, uses two 16-stage electric pumps.

When possible, almost all distribution systems are arranged to allow the villagers to connect their houses to a primary piping system that runs through their village. Public taps--four to six sets per village--are also installed. The project staff has recently begun planting fruit trees around these taps in order to use run-off water.

During site construction, subcontractors are taught improved techniques, counterparts learn construction supervision, and villagers are trained to construct, operate, and maintain the water systems. Generally two villagers are selected from each village for a short course in pump and diesel mechanics/maintenance conducted under Ministry auspices in Sanaa. (Garner Interview, 1983.)

Individual projects are funded largely by USAID with input from villagers in the form of labor and provision of local building materials such as stone. In these ways, villagers typically fund 30 to 50 percent of the direct cost of the project. For each village approved for a water project, a contract is signed by a village representative, the Ministry of Public Works, TransCentury, and usually a representative of the Local Development Authority or the Governor's Office. The Ministry of Public Works funds salaries for the ten counterparts it assigns to the project. It also provides office space for the project, administrative support, and liaison with the villages. (Carter, May 1983, p. 7.)

The Carter report states that project funding and materials supply have been adequate. TransCentury has been responsible for both domestic and international procurement.

The project in recent months acquired two sets of shotcrete equipment in order to experiment with this method of constructing water tanks. Generally, water storage tanks are built from stone. In certain instances, however, shotcrete may be both faster and cheaper than the traditional use of masonry or forms for concrete. The shotcrete technique, though relatively expensive and "high-tech," appears to be appropriate for Yemen with its capital-intensive approach to development assistance.

According to the Carter report (mid-May 1983), 23 water projects have been completed. Nine of these have elevated water towers. Fourteen additional projects have been designed and five are under construction (four include elevated towers). Forty-seven villages have been designated for project surveys. Latrines have been built in three villages and designs have been prepared for a fourth village.

In February 1983, a female Peace Corps sanitary engineer was recruited to work with another PCV and a sanitation consultant to design a health component for the program. The approach to health education is a sensitive and complex issue in a traditional, conservative society and the project is deliberately proceeding cautiously with this aspect.

In Peace Corps eyes, this project is successful. Volunteers are generally very happy with their assignments. These Volunteers are making an important contribution to Yemen's development and gaining valuable professional experience at the same time. They have a good opportunity to become skilled in Arabic and to gain a thorough understanding of the culture. The attitude of the Ministry of Public Works has changed substantially, and its officials now recognize the value and importance of Volunteers to the project. There is even occasional television coverage for project dedications. (Carter, May 1983, p. 8.)

TransCentury is generally pleased with the project. The Ministry, USAID, and TransCentury are looking for support from sources such as the World Bank, the Arab Fund, and the Islamic Development Bank to further develop the institutional capabilities of the RWSD. (Garner Interview, 1983.)

By 1982, the Small Water Project 044 was Peace Corps/Yemen's first priority with nine Volunteers. In 1983, it remains number one in priority and 12 of Yemen's PCVs are in this project.

According to former Peace Corps Director Dichter (1982), the 044 PCVs "are, to a Volunteer, the happiest, most satisfied, and perhaps also the most professional and responsible group of PCVs in Yemen. There is a striking absence of problems brought to PC staff's attention. What minor problems they do have they automatically seem to take up with TransCentury staff. One gets the impression, however, that they work out their problems by themselves and/or amongst themselves." (044 Project Meeting Summary, PCD Dichter, February 1982.)

Disaster Assistance

When the Dhamar and Dawran regions were devastated by an earthquake December 14, 1982, a reconnaissance team of Project 044 PCVs was dispatched within 24 hours. The Dutch asked to participate and two of their volunteers joined the project. Seven teams surveyed 884 villages in three weeks, identifying villages that needed rehabilitation. The Deputy Minister of Public Works was reassigned to head the Executive Office for Reconstruction of Earthquake Damaged Areas. Now, under the auspices of the Ministry of Public

Works and in collaboration with the Executive Office, 044 performs the technical work on earthquake-damaged water systems. Five more Yemeni counterparts were hired by TransCentury following the earthquake. (Garner Interview, 1983.)

TEFL Continuing Education

In addition to assigning PCVs to work directly on water projects, PC/Y was pleased to have one Volunteer, who teaches English at the National Institute for Public Administration, choose to work with Project 044 as his secondary project in the summer of 1983. The PCD helped the PCV design this project because of PC/Yemen's strong interest in increasing Yemeni English language skills. The Volunteer designed an English language curriculum and developed materials for Project 044 counterparts. He also taught English to the counterparts, some of whom spoke a little English and others none. The counterparts were interested in learning English to better communicate with American project staff, to improve their chances of obtaining further training abroad, and to obtain better employment opportunities in the future. (Carter, August 1983.)

Local Resources for Development, Project 045 (1980-84)

Collaborating Agencies: Peace Corps, CYDA, LDAs, Chemonics International Consulting Division, USAID

The goals of this project are to strengthen the capacities of CYDA, the Hodeida and Hajja Coordinating Councils, and the LDAs in Hodeida and Hajja provinces to plan, implement, manage, and finance development projects; to test technologies appropriate to Yemen; to initiate a wide range of training projects; and to conduct research into the social context in which development takes place in Yemen.

Project 045 is not simply a water sector project. Rather, it is a complicated, integrated rural development project which provides technical assistance of various kinds at various levels. This technical assistance ranges from the development of a computer-based rural information system at CYDA headquarters to the provision of a survey and a standard design to a village wanting to put in a water project or school. The project focuses on the LDA system (see page 43), which has been viewed as the only grass roots, genuinely representative organization in Yemen. (Carter, May 1983, p. 9.)

Although preliminary design for the project began in 1976 along with Project 044, negotiations between Peace Corps and USAID with reference to Peace Corps participation began in 1978. The Project Paper called for a technical PCV to discuss individual projects and a health/nutrition PCV to begin women's activities at each of six LDAs. By the time 045 actually began, the health PCV roles had been dropped and the technical PCVs were assigned at the Coordinating Council level rather than the LDA. The role of the PCVs came to be one of providing technical assistance. The Peace Corps Director (PCD) agreed initially to recruit six PCVs: two construction supervisors, one diesel mechanic, one architect, and two road surveyors.

Carter notes that the positions that these six were to occupy in the project were not well defined and both PC/Yemen and USAID/Yemen personnel expressed some concern about their fuzziness. Nevertheless, recruitment proceeded. However, in March 1979, CYDA formally requested Peace Corps to recruit 13 PCVs at very high skill levels, including three agricultural engineers. In a compromise, the PCD submitted eight requests to PC/W the following month: two architects, two surveyors, two mechanics, two engineers. The project agreement was shortly thereafter signed by USAID, CYDA, and the YARG CPO. USAID had not then named a contractor to manage the project or even solicited bids from candidates.

The Carter report (May, p. 10) chronicles the early stages of the project. In the autumn of 1979, USAID invited bids for a four-year contract. In early 1980, Chemonics won the contract, and their chief of party and a partial staff arrived in April. During the interim, six Volunteers had been recruited and were scheduled to arrive in November 1979. Delays in acquiring the necessary approvals and visas held the group up until January 1980. One PCT terminated early ("ETed") during training and a second was evacuated and later terminated for medical reasons. This left four PCVs who began work in March--before Chemonics staff came to Yemen, before the project was properly set up, before equipment arrived, and before there was any means of supporting them in their work. The Volunteers were sent to Hodeida and Hajja Provinces before the Coordinating Councils had been properly briefed about what they should do with the Volunteers; accordingly, the Councils found the presence of the PCVs somewhat perplexing. When the PCD made a site visit to Hajja in mid-May, he learned that the Secretary-General of the Coordinating Council did not even know that he had two Peace Corps Volunteers assigned to his office. One of the Secretary's employees had taken charge of the two, but he seemed unsure of their assignment. There was no office for the Volunteers, perhaps an unimportant consideration since there was no work to do in an office. They had spent the six weeks from the date of their arrival in driving around to meet several Local Development Associations. The employee was going to have them do this until they had met all 33 LDAs.

Chemonics only began to get set up during the summer of 1980, when more staff and some equipment arrived. The months from April until summer constituted a pre-implementation stage for the project, and Volunteers had no work during most of that time. PC/Yemen agreed to bring in more Volunteers for a summer training cycle. Four PCTs arrived in July and began work in September. At the same time, Peace Corps recruited two additional well diggers and two rural development administrators.

According to Carter, the result of this poor timing was that Volunteers in the first two groups lived through months of relative idleness and some became so demoralized that even when the project, particularly in Hodeida, picked up speed, they had trouble adjusting their attitude toward the project per se and toward their contribution to development generally. A few dissatisfied Volunteers created a management problem for Chemonics and PC/Yemen staff, even though Chemonics staff were particularly understanding and accommodating.

Two PCV construction supervisors arrived in the autumn of 1981 and were assigned, in January 1982, to Hodeida. One engineer, who arrived at the same time, was assigned to Hajja. Two more PCVs, an architect and a very experienced construction supervisor, were assigned to Hajja in the spring of 1982.

Some of these placements were somewhat ill-advised, given the amount and kind of work available. Providing technical assistance was a legitimate and necessary activity, but it was not without attendant frustrations. Such assistance was not always properly valued--feasibility studies would be ignored and designs abandoned either because of high cost, local inability to see the need for more complicated structures, or inability of private contractors to execute any project that was at all technically complicated. Accordingly, Carter reports (May, p. 11) that PCVs sometimes felt that their efforts were wasted.

Two PCVs from the first group ETed in the early summer of 1980. One from the second group ETed in early 1981. During the course of their tour, several others either considered terminating or asked for transfers.

The first PCV architect assigned to Hajja concluded at the end of his service that he had largely wasted his time. He was replaced by a second PCV in April 1982 despite the fact that an architect's skills were not vital to roads and water projects, the development priorities in Hajja. This PCV subsequently left the country in September in the wake of political problems which brought on the collapse of Project 045 in Hajja. A PCV engineer assigned to Hajja in January 1982 felt that the project only produced enough work to keep the more experienced Chemonics staff engineer busy. She too was obliged to leave the country in September 1982. (Carter, May 1983, p. 11.)

Two architects, one engineer, and one construction supervisor were assigned to Hodeida in the autumn of 1982 to replace departing Volunteers. A fifth transfer-extension terminated during training because, according to Carter (p. 12), he did not like the way the project was administered and he felt that he would have less genuine work and less independence than he had had in his previous Peace Corps assignment.

PCVs in 045 were obviously less satisfied than those in 044. One reason may have been that project 045, with its emphasis on institution-building rather than on the construction of visible projects, was a more complicated project than 044. Project 045 attempted to develop the LDAs' capacity to complete development projects. By its nature, 045 was bound to progress more gradually and with fewer tangible results. (CMP, Narrative Update, FY1982, p. 10.)

Some Volunteers assigned prior to September 1982, and particularly those recruited in January and July 1980, voiced resentment of their assignment to a profitmaking company such as Chemonics. They resented to an even greater extent the fact that they were working alongside highly paid American contract staff. One PCV expressed the cynical belief that it was partly his gift of two years of his professional life that allowed the project to pay such high salaries and generous field per diems to its contract staff. (Carter, May 1983, p. 12.)

According to APCD Carter, the real problem here, however, may have been lack of adequate work. Had these Volunteers had meaningful work from the beginning, they might have been more willing to accept the trade-off of working for an American organization. In Yemen, an American organization offers the advantage of a manageable and well-organized work environment and a structure that PCVs can understand and manipulate. Project 044 PCVs have, for example, generally recognized the important intermediary role that Trans-Century fills vis-a-vis Volunteers and the YARG Ministry of Public Works. In general, therefore, they have not had the same complaints about working for an American private enterprise.

Project 045 was allocated funds to do several matching grant projects from beginning to end (up to $50,000 from USAID) but, because of both the difficulty of raising matching funds on the Yemeni side and for political reasons, there were long delays in choosing sites for these projects. The first matching grant project was completed in Hodeida two years after 045 began. In Hajja, the first matching grant project did not start for two-and-a-half years. Chemonics has since closed its office in Hajja, but is still trying to fulfill the commitment it made on matching grant projects without a permanent staff or office in the area. (Carter, May 1983, p. 11.) Individual project agreements were always on the verge of being signed, and Chemonics wanted to have enough Volunteers to handle this work load once it got under way. Staff were no doubt correct in thinking that when the situation finally did begin to move it would be important for the project's reputation and its future to be able to act quickly and not be caught with a work force that was suddenly inadequate to the amount of work.

A February 1983 USAID project evaluation stated that this was an overly ambitious project, designed as a complex integrated rural development effort, with serious problems; prospects for achieving its original purpose were minimal. Assumptions that the CYDA could absorb the technical assistance package and translate it into significant institutional changes, and that LDAs were viable instruments for local development were unrealistic. Difficulties were also caused by socio-political constraints in the Hajja Governorate and poor communication between project staff and local officials. Although the contractor, Chemonics, provided experienced and capable personnel, only half spoke Arabic well. Training activities in particular lagged. (Ponasik, et al., February 1983.)

Additionally, implementation success in Yemen depends on YARG cooperation and its ability to support activities in remote rural areas. Project experience shows that rural projects in Yemen should have easily defined and demonstrated goals which can be readily communicated to local officials. Language skills and technical expertise are equally important.

Since the autumn of 1982, Project 045 has been operating more smoothly, according to Carter. Volunteers now spend most of their time in the field instead of simply manning the technical office in Hodeida. Lengthy slow periods no longer seem to be a problem. Staff-Volunteer relations have improved substantially and now seem to be very cordial.

The newest group of Volunteers in Hodeida is both busy and happy. In an experiment, PC/Yemen recruited, at Chemonics' request, one engineer to be assigned in March 1983 to the Planning Department at CYDA. He provides technical assistance to LDAs in the form of feasibility studies, surveys, and designs. His time seems to be productively employed and although urban-based, he spends a fair amount of time in the field. Currently, this PCV, with the approval of the PCD, is assigned to reenter Hajja to complete the project which came to an abrupt halt in September 1982. (Carter, May 1983, p. 12.)

Carter reports that, to date, one water project, including a hand-dug well designed to serve as the source for the al-Maghraba Central Water Project, has been completed in al-Maghraba, Hajja. Much more has been accomplished in Hodeida. Two matching-grant water projects have been completed and five are in progress. All these projects rely on elevated concrete storage tanks. In Khowfan village, site of one of the completed projects, PCVs have encouraged villagers to irrigate a small garden plot next to the water pump in order to take advantage of waste water. They have also shown villagers how to use soapy waste water to irrigate a backyard garden.

In recent months, one Volunteer has been designing latrines. Volunteers have also done surveys, feasibility studies, cost estimates, and designs for other water projects being constructed with 045 technical assistance, but without 045 funds or construction supervision. Since the 045 project is not strictly a water-sector project, Volunteers have been involved in work on schools, clinics, and other kinds of buildings. They have, as noted earlier, been involved in the training of private, commercial contractors who tend not to be very well skilled in working with concrete. Volunteers have also helped compile manuals of standard designs.

PCVs in this project, until recently, did almost no training of Yemenis. They functioned largely as a design staff, with some Volunteers getting to do some construction supervision once matching-grant projects began. Volunteers believed that the technical office's Yemeni counterparts, of whom there were very few, preferred drafting in the office to field work. PCVs felt they had been given no opportunity to pass on their skills to Yemenis and thought they should not be replaced by other PCVs. Some training has, however, been done with private contractors and village labor. Recently the office acquired a new group of counterparts, and the relationships between these men and the Volunteers seem to be better than previous ones.

Recently, a PCV construction supervisor designed and submitted a project proposal to USAID for a solar water pump. Solar technology is very new to Yemen and holds great promise for the future, given Yemen's vast amount of sunshine and the limited maintenance required by solar devices. USAID has approved this $17,500 project for funding. The LDA and village involved have approved the design. The pump will be put together as soon as the necessary parts are imported. (Carter, August 1983.)

As with Project 044, those architects and engineers recruited for Project 045 have tended to be recent university graduates without much formal professional experience. Construction supervisors have ranged from very skilled in at least three cases to relatively unskilled in two cases. PC/Yemen has had a problem supplying these PCVs with adequate technical training, and most of the training that has been done has occurred on-the-job after the Volunteers were sworn in. Four PCVs recruited in the summer of 1982 participated in a water/sanitation SST program, but according to Carter (p. 13), they have been the only group thus far.

Project 045 was scheduled to end the summer of 1984 and it appears unlikely, at this writing, that USAID will extend it. With the exception of the one PCV who is assigned to the Planning Department of CYDA and whose position will remain viable, all PCVS will have COSed by September 1984.

Small Rural Water Projects, 1978 to the present

Collaborating Agencies: Peace Corps, Catholic Relief Services, the CYDA.

In March 1983, the Peace Corps Director transferred one PCV construction supervisor from Project 044 to CRS to work on small water projects. CRS had been short of staff for some months, and the Volunteer wanted to change projects because he resented working for a profit-making organization. The PCV now functions as a project officer in charge of the planning and implementation of water projects. Working under the direct supervision of the CRS Program Director, he gives technical advice and assistance, makes site visits, maintains project files, keeps financial records, and writes progress reports. He oversees the construction of water systems and helps plan new water projects. He eventually assumed the responsibility of programming a CRS grant to the earthquake-stricken region of Dhamar.

PEACE CORPS/YEMEN

Collaboration

Most Peace Corps projects were in collaboration with the Local Development Authorities and the Confederation of Yemeni Development Associations and the Ministry of Public Works. Other agencies involved included CRS, OXFAM, Save the Children, and USAID.

In the 1980s an innovative type of project infrastructure began with formal written agreements involving YARG, USAID, Peace Corps, and U.S. private enterprise--one project with the New TransCentury Foundation and one with Chemonics.

Training

Presently Peace Corps/Yemen has a full-time Yemeni training officer. The training officer handles administration and scheduling of training sessions and trains language instructors. A professional trainer is hired for each session. For Project 044, TransCentury provides two months of on-the-job technical training.

The standard pre-service training (PST) consists of five weeks of introductory language training and cross-culture instruction, followed by five or six weeks of technical language training. There are several weeks of site visits when Volunteers work with projects. By the end of training, an FSI 1+ proficiency is expected in Arabic. In-service training (IST), held mid-tour, consists of a one-week workshop with 30 hours of language training related to the PCV's field of work. Conferences are held after three months and at mid-service for discussion of problems and project status.

The PST and IST have been opened to other PVOs and to private individuals working in Yemen. To date, British, Swedish, Dutch, German, Irish, and Norwegian volunteers have participated. The fees established for these courses have allowed PC/Yemen to develop new materials, provide more teacher training, hire more qualified staff, and locate a more adequate training site. Participants benefit from improved language skills and understanding of the culture and the development process in Yemen. Volunteers from various agencies become familiar with each others' work, and throughout their stay in Yemen discuss mutual problems and how to overcome them. (CMP FY1982, p. 12.)

PC/Yemen has long hoped to have all its 044 and 045 PCVs benefit from a water/sanitation stateside training program (SST), but generally it has proven difficult either to coordinate training cycles with SST dates or to reserve the required number of slots for recruited PCVs. Unfortunately, PC/Yemen does not recruit Volunteers in sufficient numbers to allow it to schedule its own SST through the assistance of PC/Washington. In 1981-82, PC/Yemen examined the possibility of recruiting someone from the Indian Health Service to do joint incountry technical training for 044-045 Volunteers, but the idea was not pursued very far because costs in Yemen are very high, government permits can be time-consuming and difficult to acquire, and the kinds of activities pursued by the two projects do not overlap entirely. In the summer cycle (1983), PC/Yemen will, however, experiment with incountry technical training for the 044 PCTs and a new project, Earthquake Reconstruction. PC/Yemen is to hire two COSing 044 PCVs on Personal Service Contracts (PSCs) to conduct a four-week technical training. New TransCentury Foundation offered to provide facilities and a project site for the technical training. (Carter, May 1983, p. 8.)

The Executive Council of Earthquake Reconstruction will participate in the designing and implementation of the technical training. This will be the first time that PC/Y has asked the Yemen government to take an active role in the technical training of PCTs.

Women in Development (WID)

Women are the main beneficiaries of Projects 044 and 045. Since the women do much of the agricultural work as well as the cooking, cleaning, and childtending, the time that the new water distribution systems save them is vital.

Yemeni women have not been involved in the planning or implementation of projects.

Presently, only two female Volunteers--one architect (045) and one sanitary engineer (044)--are involved in water projects in Peace Corps/Yemen, although there were also women involved in the Mahweit project. Considering Yemen's traditional, conservative Islamic culture, and the nature of the work, which, to date, requires traveling, working, and living with male Yemeni counterparts, the presence of these two PCVs represents considerable progress for PC/Yemen.

ANALYSIS*

Yemen is a water-scarce country and consequently places a very high priority upon water supply issues. Peace Corps/Yemen potable water programs started with Peace Corps' entry in 1973. Though a number of projects failed, Yemen now has a working model project (Small Water Projects 044) integrating YARG, Peace Corps, an outside funding agency, and a private U.S. firm.

Aspects Contributing to Project Successes

- Once construction and maintenance training components are built into the design of the project, Yemeni villagers were able to maintain installed pumps. Government-employed Yemenis were capable of operating drilling rigs to carry on the program using local manpower.
- The innovative combination of YARG cooperation, USAID funding, Peace Corps human resources, and private U.S. firm management in the 044 Small Water Projects Program addressed previous project weaknesses.
- Planning of the Volunteer level for the 044 Small Water Projects Program was well thought out, starting small and building as needs arose. Starting with new trainees was also advantageous in setting a positive attitude from the start.
- Supervision of Volunteers in the 044 Project by a U.S. private firm provides otherwise unavailable management and technical expertise.
- Recruitment of TransCentury staff was appropriate. Staff are technically qualified, speak the local language, and have experience in the Middle East, factors which increase cooperation with Yemenis.
- Counterparts were assigned immediately under the Small Water Projects (044) Program, signifying a genuine commitment to the program by the Yemen Government.
- Projects which fully utilize Volunteer skills and time, such as 044, are more successful.
- Aspects of sanitation in the form of improved latrine construction were introduced to the project; health education was planned for Phase II.
- Local participation was obtained in the form of labor and local construction materials, indicating the commitment to the project by the villagers.

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*by Joseph Gadek, Diana Talbert, and Lynn Carter.

- A legally binding contract was signed by the village leadership, guaranteeing village support in the form of labor and materials.

- Women were included in the Mahweit Project staff and Volunteer group which helped make contact with the local women, who were most directly affected by sanitation and water supply issues.

- Volunteer knowledge of the Arabic language and cultural awareness has been instrumental in effectiveness in rural areas.

Aspects Hindering Project Successes

- Poor timing and management placed Volunteers into new programs which were untested and uncertain of funding.

- The Haima Small Dams Project failed because project design was faulty, funding was not secured, and too many PCVs were recruited to start up a project which could have been expected to make slow progress initially.

- Changes in political leadership during project start-up adversely affected the Haima Small Dams Project. Factionalism in Mahweit province contributed to the phasing out of the Save the Children project.

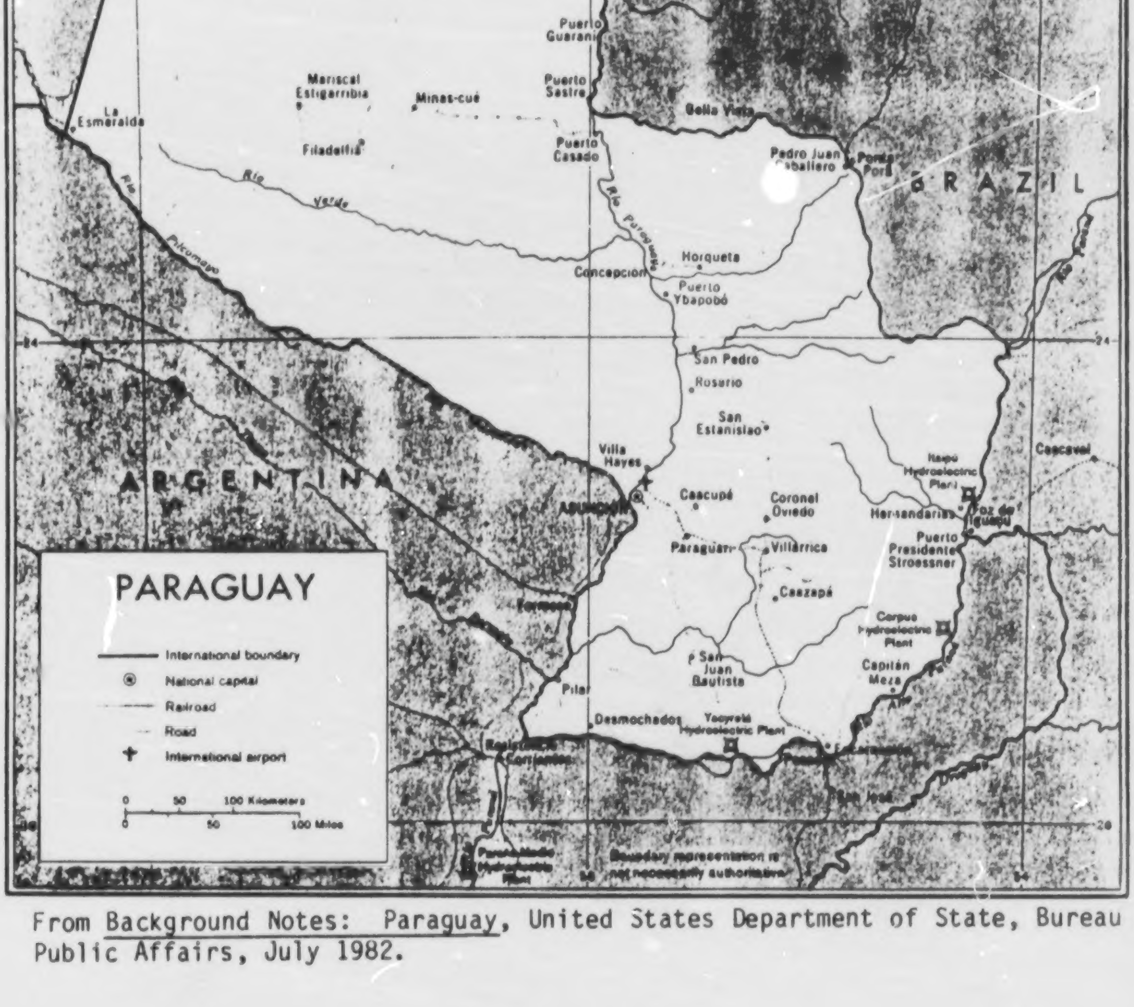
- A manpower shortage prevented adequate Volunteer supervision by relatively new ministries.

- Bringing Volunteers into a specific project before that project was set up and functioning was detrimental to Peace Corps' reputation, unfair to Volunteers, and problematic for PC and project staff. This was especially true when an expected early start did not materialize.

- Lack of trained personnel for counterparts resulting from higher income opportunities in neighboring Saudi Arabia was frequently a problem.

- Project 045 initially had cooperation problems between villagers and Volunteers due to staffing delays and Volunteers'/staff's lack of Arabic and Middle Eastern experience. Lack of full Volunteer utilization because of slow project start-up also caused Volunteer frustration.

REPUBLIC OF PARAGUAY
CASE STUDY AND ANALYSIS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Minas-cué
La Esmeralda
Filadelfia
Puerto Casado
Bella Vista
Pedro Juan Caballero
Ponta Porã
Río Verde
Río Pilcomayo
Río Paraguay
Horqueta
Concepción
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San Pedro
Rosario
San Estanislao
Villa Hayes
Asunción
Caacupé
Coronel Oviedo
Paraguarí
Villarrica
Caazapá
Itaipú Hydroelectric Plant
Hernandarias
Foz do Iguaçu
Puerto Presidente Stroessner
Cascavel
Corpus Hydroelectric Plant
Capitán Meza
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Pilar
Formosa
Desmochados
Yacyretá Hydroelectric Plant
Resistencia
Corrientes
Encarnación
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San José
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Railroad
Road
International airport
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Boundary representation is not necessarily authoritative
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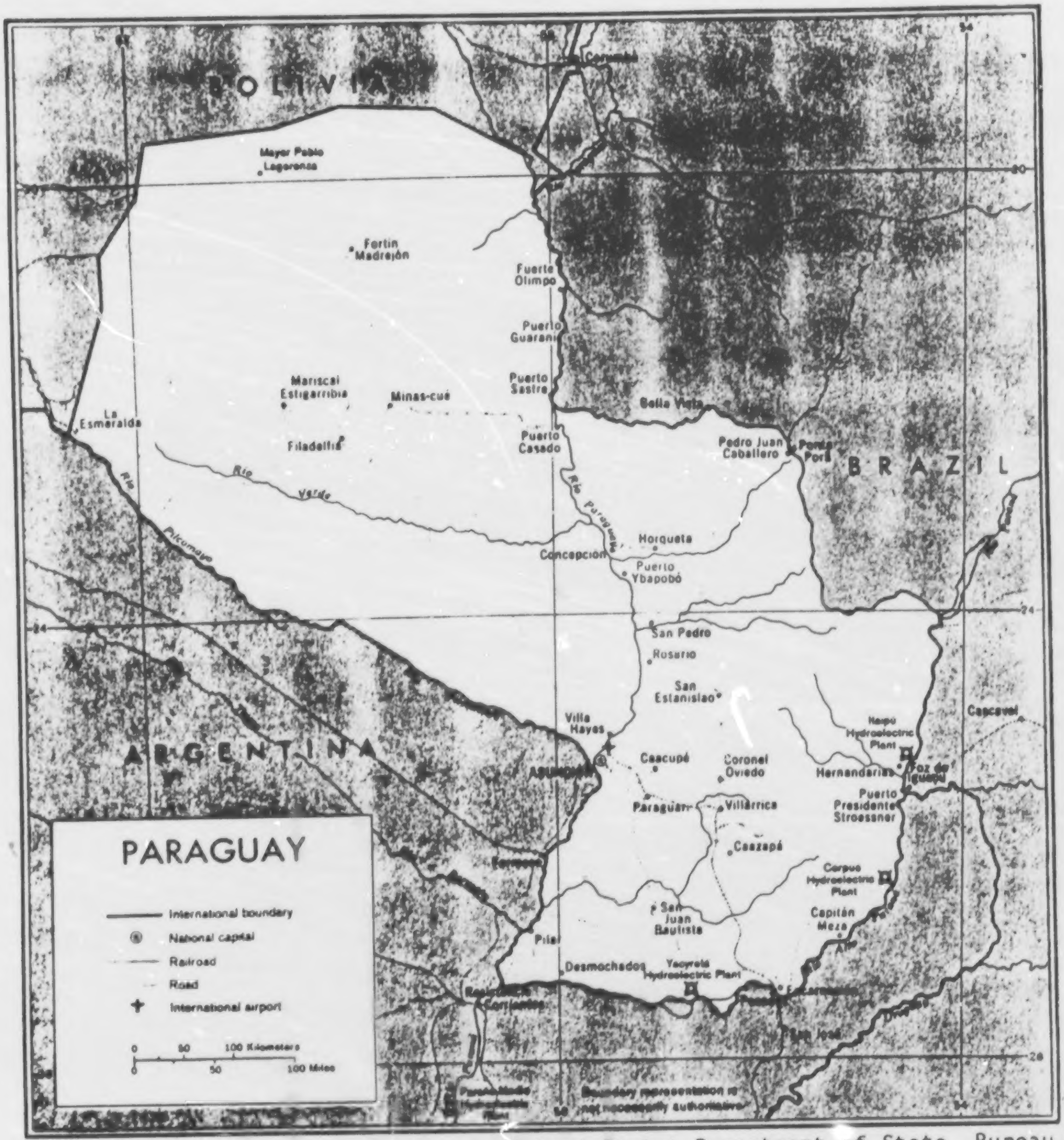
From Background Notes: Paraguay, United States Department of State, Bureau of Public Affairs, July 1982.

REPUBLIC OF PARAGUAY
CASE STUDY AND ANALYSIS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Corumbá
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Fortín Madrejón
Fuerte Olimpo
Puerto Guaraní
Mariscal Estigarribia
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Bella Vista
La Esmeralda
Filadelfia
Puerto Casado
Pedro Juan Caballero
Ponta Porã
BRAZIL
Río Verde
Río Pilcomayo
Río Paraguay
Horqueta
Concepción
Puerto Ybapobó
San Pedro
Rosario
San Estanislao
Villa Hayes
Asunción
Caacupé
Coronel Oviedo
Paraguarí
Villarrica
Caazapá
Hernandarias
Itaipú Hydroelectric Plant
Foz do Iguaçu
Puerto Presidente Stroessner
Cascavel
ARGENTINA
Corpus Hydroelectric Plant
San Juan Bautista
Capitán Meza
Pilar
Desmochados
Yacyretá Hydroelectric Plant
Encarnación
Posadas
San José
Corrientes
PARAGUAY
International boundary
National capital
Railroad
Road
International airport
0 50 100 Kilometers
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Boundary representation is not necessarily authoritative
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From Background Notes: Paraguay, United States Department of State, Bureau of Public Affairs, July 1982.

COUNTRY BACKGROUND*

Geography

PARAGUAY
Asunción
Atlantic Ocean

Landlocked in the heart of South America, Paraguay is surrounded by Argentina, Brazil, and Bolivia. The Parana-Paraguay River system flows south through the center of the country, dividing it into two disparate regions. Eastern Paraguay lies in the temperate zone and consists of gently rolling country with wooded hills, tropical forests, and fertile grasslands. Here the annual rainfall averages 157 centimeters (62 in.), but is subject to great local and year-to-year variation.

Western Paraguay, usually called the Chaco, is a low, marshy plain covered with dense scrub forests. The climate is semi-arid. Westward from the Paraguay River and the meandering, unnavigable rivers that drain into it, the land becomes drier and water is scarce. Rainfall in the Chaco averages about 81 centimeters (32 in.) annually.

Paraguay's population of 3.1 million (1981) is distributed unevenly throughout the country. The vast majority of people live in the east, most of them within 160 kilometers of Asuncion, the capital and largest city. The Chaco, which accounts for about 60 percent of Paraguay's territory, is home for less than 4 percent of the population. In 1976, 37 percent of the population was classified as urban (defined as living in district capitals) and the remaining 63 percent defined as concentrated or dispersed rural. In 1976, there were only 35 communities (representing about 29 percent of the total population) with more than 4,000 inhabitants each, including Asuncion.

The work force numbers 1.2 million, of which 44 percent are engaged in agriculture, 34 percent in industry and commerce, 18 percent in services, and four percent in government.

Ethnically, culturally, and socially, Paraguay probably has the most homogeneous population in South America. About 95 percent of the people are of mixed Spanish and Guarani Indian descent. Little trace is left of the original Guarani culture except the language, which is understood by 90 percent of the population. About 75 percent of all Paraguayans speak Spanish. Guarani and Spanish are both official languages.

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*Excerpted from Background Notes, U.S. Department of State, Bureau of Public Affairs, July 1982, and Peace Corps/Paraguay Country Management Plans.

N.B. Thanks to Kate Raftery for making this case study possible.

Government

Paraguay has a highly centralized government based on the constitution promulgated in August 1967. Though in form a constitutional republic, the preponderance of powers rests with the executive branch. The President, popularly elected for a five-year term, is assisted by an appointed cabinet.

The bicameral Congress consists of a 30-member Senate and a 60-member Chamber of Deputies. Deputies and Senators are elected concurrently with the President. Under Paraguayan electoral law, the party polling the largest number of votes in the Congressional elections receives two-thirds of the seats in each chamber. The remaining seats are divided proportionately among the other contending parties.

In the three-month period when Congress is not in session (from December 21 to the end of March), the President may issue decree-laws that must be submitted to the Congress for approval when it reconvenes. A Council of State composed of representatives from various sectors of the society advises the President on the issuance of decree-laws.

Paraguay's highest court is the Supreme Court of Justice. Its five judges are presidentially appointed.

For administrative purposes, Paraguay is divided into 19 departments, each headed by a Government delegate appointed by the President.

There is universal suffrage for all adults aged 18 and over.

Economy

In 1980, Paraguay's GNP was estimated at $4.5 billion, with an annual growth rate of 10 percent. Per capita GNP (1980 estimate) was $1,480.

Paraguay is predominantly an agricultural country with no significant mineral or petroleum resources. Agricultural commodities account for 30.8 percent of the GNP, as well as a large percentage of the country's exports. Twenty percent of the country's 9 million hectares of arable land is cultivated, and the principal crops are corn, sugarcane, soybeans, and cotton. There is little agricultural diversification.

Industries--particularly sugar refining, cement, textiles, beverages, and wood products--account for 23.3 percent of Paraguay's GNP.

Paraguay has exceptional hydroelectric potential. Construction of the massive Itaipu hydroelectric project with Brazil has enhanced Paraguay's economic development, and the anticipated commencement of work on the Yacyreta and Corpus hydroelectric projects with Argentina should further spur the Paraguayan economy. Within the next decade, Paraguay should become the world's largest exporter of hydroelectric energy.

Nonetheless, the government faces many of the economic problems common to developing countries. Particular obstacles to Paraguay's development are fluctuating prices for major export items, the long and expensive river route that exports must follow to reach the ocean, an almost total lack of known mineral resources, and a small domestic market.

Despite these limitations, agricultural production has been growing rapidly, especially cotton and soybeans for export. The economy usually has been favored by relative price stability, but during 1980, the rate of inflation was 22.4 percent.

The country's stable government, conservative fiscal and monetary policies, and laissez-faire approach to trade and investment have brought economic improvement to a broad segment of the population. The government has attempted to ameliorate rural poverty with a colonization program, which has offered new lands to more than one-sixth of the nation's small farmers.

Between 1946 and 1980, Paraguay received more than $690 million in assistance from the Inter-American Development Bank (IDB), the International Bank for Reconstruction and Development (IBRD), and the United States to help finance economic development projects.

The Physical Quality of Life Index (PQLI)* has been figured at 78. The PQLI for PC countries of the Inter-American Region ranges from 59 to 92; Paraguay ranks eighth of 13.

Water/Sanitation

It was estimated that by the end of 1977 only 19.8 percent of the total population had easy access to water supply. Of rural households surveyed, only one percent in towns of fewer than 4,000 population had potable water available, and only 13 percent of the rural population as a whole had access to potable water supplies (Ministry of Health figures). Thirty-two percent of the rural population got water for home consumption from a nearby spring, and more than 60 percent had a hand-dug well with rope and bucket for drawing water. Some had to carry water from a nearby stream or river. (WHO Water Sector Digest, Paraguay, 1979.)

Health

Infant mortality is declining but, at 58 per 1,000 live births, Paraguay ranks fifth highest of twenty Inter-America Region Peace Corps countries. Infant and child deaths account for 46 percent of all deaths in Paraguay although these groups compose less than 20 percent of the total population. The major causes of both morbidity and mortality, especially among children under five years of age, fall into the category of infections and parasitic diseases. For children less than five years old, diarrhea continues to be the major cause of death. (CMP FY1980, p. 13.)

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*The Physical Quality of Life Index (PQLI) was developed by the Overseas Development Council as a non-income measurement that summarizes many aspects of well-being. The PQLI is calculated by averaging indexes on a scale of 0 (the most unfavorable performance in 1950) to 100 (the best performance expected by the end of the century) for infant mortality, life expectancy, and literacy into a single composite index.

Asuncion is the only city with a public sanitary sewer system. The system serves 43 percent of its population. (Background Notes, Department of State.) About 70 percent of the population use unsanitary latrines or no latrines at all and 87 percent of the rural population drink water from sources open to contamination, providing a direct connection between environmental sanitation and the disease and death rates. The poor sanitation conditions are accompanied by lack of knowledge about proper nutrition, diet, and health care. (CMP FY1980, p. 13.) It is estimated that 50 to 60 percent of all rural communities are still lacking either a health post, a trained practitioner, or both. (CMP FY1984, p. 15.)

Implementing Agencies

The Ministry of Health (MOH) is charged with providing medical services and promoting public health measures, as well as coordinating and supervising all public and private health services. It reaches 56 percent of the population. (CMP FY1980, p. 24.)

For purposes of administration, the country is divided into eight public health regions, each headed by a director responsible for the implementation and supervision of programs. There is some regional autonomy, although norms and standards are prescribed at the ministerial level.

Health posts provide primary level care, principally in towns of less than 2,000 population, and are staffed by auxiliaries. The health posts provide first aid, pre-natal care, and vaccinations. Health centers have more complete facilities (with beds for in-patients) and an expanded staff. They provide primary care and receive referrals from the health posts. Patients needing more specialized care can be referred to the larger health centers or the hospitals.

Problems in the provision of health services lie in the lack of coordination between different institutions of the sub-sectors, duplication of services in some areas, insufficient biostatistical data, delays in the approval of a national health code, and lax enforcement of health legislation.

From 1956 to 1972, the Ministry of Health carried out programs of spring protection and well and latrine construction. In some projects during this time, wells drilled for health centers and public schools served as demonstration projects for villagers and for sanitary technicians. However, a need was felt for a decentralized organization within the health sector, with a high degree of autonomy and administrative flexibility, which could make efficient use of central government funds in addressing needs for potable water and sanitation.

In 1973, the MOH was attempting to address the disease problem at the source--unsanitary waste disposal and contaminated water supplies--through the use of "sanitary inspectors" stationed at approximately fifty of the rural health centers. The inspector's job was to encourage, organize, and implement construction of latrines, sanitization of existing wells and springs, construction of new wells, and construction of piped water systems. Since there was little government financial support for such projects, the sanitary inspectors' job was primarily one of encouraging and guiding self-help efforts. (CMP FY1974, p. 17.)

In 1973, the Ministry of Health initiated SENASA (the National Service of Environmental Sanitation), the specialized government agency responsible for water supply and excreta disposal in small urban (communities having fewer than 4,000 inhabitants) and rural areas.

One of SENASA's goals was to find a solution to the problems of water in the "rurban" villages (small, concentrated populations of up to 4,000 inhabitants). Solutions included installing piped water schemes, providing drinking water to the dispersed rural population, and arranging for adequate waste and garbage disposal throughout the country. (Cardenas, 1979, p. 110.) A ten-year program was envisioned with the following five-year objectives:

- provision of potable water systems to 80 communities of fewer than 4,000 inhabitants;
- construction/repair of 18,550 wells;
- anti-parasite treatment of 70 percent of the population in the program area;
- extensive training courses for Ministry personnel and community leaders; and
- organization of 1,128 sanitation commissions in 94 communities.

The program, when established, was estimated to cost $9,550,760. Five percent of funding for the program was to come from UNICEF, 13 percent from the Government of Paraguay (GOP) through a tax on beer, 20 percent from local communities, and 62 percent from a rotating fund to be financed by IDB. (CMP FY1974.)

SENASA's program is based on community involvement--in preliminary surveys, in the decision as to the type of services provided, in community and school sanitation education programs, and in the construction of the water supply system. (See Appendix D.1 for SENASA's "Five Steps to Establishing a Water Supply System.") An elected Water Board is entrusted with the responsibility for the management and maintenance of the system once completed, its members as well as the system's operators having undergone a special training course. (Cardenas, 1979, p. 110.)

Another agency involved is CORPOSANA (the Sanitary Corporation), an autonomous public agency linked to the Ministry of the Interior. CORPOSANA is responsible for developing and maintaining water supply and sewerage systems (including storm drainage) in communities having more than 4,000 inhabitants.

The Inter-American Development Bank (IDB) has made major loans to assist CORPOSANA in the construction of urban water supply and sanitation systems. The IDB has also provided technical assistance in constructing and equipping health posts and health centers, creating a new training school, and supporting the training of health personnel. (WHO Water Sector Digest, Paraguay, 1979.)

OVERVIEW OF CASE STUDY PROJECTS INVOLVING WATER/SANITATION*

Name	Year(s)	Goals/Activities	Size**
Environmental Sanitation Project	1968-present	PCVs work to decrease morbidity and mortality rates by reducing incidence of parasites from contaminated water sources and unsanitary waste disposal. They instruct the community as to the relation between proper sanitation and disease control. PCVs conduct house to house inspection of water sources and sanitary facilities; maintain and repair wells and latrines; work on protection of natural water sources; promote planning, financing, constructing running water systems; install water pumps; construct latrines; encourage excavation of trash pits; provide education through home visits, classes; train and provide auxiliary sanitary inspectors to rural health centers; and initiate projects for sanitary waste disposal, purification of existing water supplies, and development of new water supplies.	Medium-Large
Health Education Project (joined) with Environmental Sanitation Project in 1980)	1968-79	PCVs worked as health educators in rural health centers to complement activities of the Environmental Sanitation Project.	Medium
Rural Health Project	1979-present	PCVs improved low-cost rural health delivery services; promoted improved health practices and understanding through schools, community organizations, and health centers; were involved in construction of latrines and wells; and were involved in sanitary waste disposal.	Medium

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*This information is taken from Phase I, the Survey of Peace Corps Water and Sanitation Activities from 1970 through 1982.

**Project size is indicated as follows: "Small" represents under five Volunteers; "Medium," 6-12; "Large," 13 or more. Number of Volunteers varied from year to year, therefore this label indicates an average.

TIMELINE OF SIGNIFICANT EVENTS
COVERED IN THE PARAGUAY CASE STUDY

	1967	Peace Corps entry
Health Education Project begins (women)	1968	Environmental Sanitation Project begins (men)
Rural Health Project begins	1979	Health Education Project Volunteers merged into Environmental Sanitation Project or Rural Health Project
Volunteer Activity Survey		
Consultant Report	1981	
Volunteer Activity Survey		
Consultant Report	1982	SENASA-Peace Corps meeting
Health Job Conference		
	1983	Agreement signed between the Ministry of Public Health and Social Welfare and Peace Corps/Paraguay

HISTORY OF PEACE CORP WATER/SANITATION ACTIVITIES

Paraguay is unique among Peace Corps countries for its long-standing concentration in environmental sanitation and health education. Peace Corps entered Paraguay in 1967 and immediately began programming generalist Volunteers in health. The earliest programs--the Environmental Sanitation Project (male Volunteers) and Health Education Project (female Volunteers)--were planned as complementary projects and are described in this case study concurrently until their union in 1980 as one project, Environmental Sanitation.

Peace Corps felt the greatest opportunities for effective Volunteer programming in rural Paraguay existed where there was need for person-to-person assistance on a level that the generalist Volunteer could address if properly trained. Peace Corps' rural programming was intended to provide the link between institutional resources, usually based in Asuncion, and the intended beneficiaries. (CMP FY1974, p. 6.)

While the Ministry of Health (MOH) had made some effort to extend health education into the rural interior, most small health centers did not have a health educator and were served only by occasional visits from regional personnel. Peace Corps/P took the initiative in rural environmental sanitation programming to fill the gap.

Volunteers created their own projects and job definitions in most cases and counterpart involvement varied from site to site. For a number of reasons, Ministry support for the program was insufficient until recent years.

However, a number of factors led to improved success and satisfaction in both Peace Corps and the government of Paraguay: establishment in 1973 within the Ministry of Health of a division to deal specifically with water and environmental sanitation; continuity of PC staff; signing of an agreement in 1983 between PC/P and the MOH defining roles and responsibilities; and focus of Volunteer activities on small projects in remote locations.

Environmental Sanitation (men) (1968-present)

Collaborating agencies:* Peace Corps, Ministry of Health, World Bank, West German Government, UNICEF, WHO, Pan American Health Organization, World for Peace, Municipal Development Institute, Institute of Basic Sciences, Catholic Relief Services, Peace Corps Partnership Program

Health Education (women) (1968-79)

Collaborating agencies: Peace Corps, Ministry of Health, USAID

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*Agencies may collaborate on projects in a number of ways: funding such as by the World Bank, EEC, USAID; in a cooperative effort such as with CARE, CRS, CUSO; or as part of a signed agreement such as with TransCentury Foundation or a Ministry of Health.

1968-1973 Activities

From 1968 to 1973, an average of ten Volunteers per year worked as auxiliary sanitary inspectors in rural health centers. Their goals were to decrease incidence of fecal-borne diseases in the community and surrounding garm area through initiation of projects for sanitary disposal of waste, purification of existing water supplies, and development of new water supplies. Through education in the need for and the use and maintenance of such projects, Volunteers worked to expand the influence of health centers and sanitation programs in the communities. (CMP FY1974.) Beneficiaries were people in rural towns with lower incomes and an education level of two to six years. (Questionnaires.)

Management support for these projects came from the Ministry of Health through the local health center director (an M.D.), regional sanitation supervisors, and a headquarters supervisor (a sanitary engineer).

In 1973, Volunteers were assigned to the newly created MOH agency, SENASA. That year there were ten Environmental Sanitation Volunteers who constructed 135 latrines, built or improved six wells, started three piped water projects, and completed two. (CMP FY1975-77.) Recruitment in 1974 for Environmental Sanitation requested six male Volunteers, three of whom were to be single. Married Volunteers' wives were assigned to the Health Education Project.

During this five-year period, the average year saw the completion of one community survey of sanitary needs; 30 to 50 latrines built; 20 to 30 wells/springs dug, repaired, or improved; 10 to 15 trash disposal projects in operation; initiation or implementation of one piped water project; and sanitary education activities (group meetings, home visits) carried out in connection with each of these projects.

1974 Sanitary Survey and Education Campaign

In 1974, Peace Corps and USAID initiated a project to provide a sanitary facility for every household and to eradicate intestinal parasites in 90 percent of the population in the town of Ybycui by 1976. These goals were to be accomplished by conducting a sanitation survey and an education campaign, organizing the construction of sanitary latrines, and administering anti-parasite medications. (Shefsky, 1983.)

Peace Corps Volunteers were assigned to carry out the project in conjunction with the doctor at the local health center. After conducting a sanitation survey of all of the housing units in town, the PCVs conducted an intensive educational campaign. However, by the end of the campaign, the Volunteers concluded that the larger goals of latrines construction and treatment with medications could not be met due to failure to enlist Paraguayan involvement both at the national and local levels. However, the seeds of education had been planted and the Volunteers hoped that eventually sanitation condictions would improve due to increased awareness of the problem. In fact, they were later improved through Peace Corps and SENASA efforts.

In 1982, two former Volunteers, a current Volunteer, and four SENASA inspectors replicated the 1974 survey to identify changes in sanitation conditions in Ybycui. Survey results indicated a significant increase in sanitation facilities from 48 percent in 1974 to 73 percent in 1982. Improvment in sanitation conditions was attributed to health education, SENASA courses, installation of piped water systems, construction of sanitary latrines, backyard garbage pits, and better personal hygiene. (A 1983 master's thesis in Public Health, the product of a Volunteer on this study team, records changes in sanitation conditions in Ybycui for 1974-83.)

Five Volunteers, representing six person-years of work in sanitation, were active in Ybycui between 1974 and 1982. SENASA inspectors had also been working in Ybycui during this eriod for an equal number of person-years. Town leaders interviewed were aware of the Peace Corps Volunteers who had been working in Ybycui since 1974 and felt Volunteer efforts had contributed to sanitation improvements.

1975 Activities

For the first half of 1975, male Volunteers in Environmental Sanitation continued with construction of latrines and water systems in rural posts, but their objectives were poorly met. More than half of these Volunteers failed to produce worthwhile results because of lack of agency (MOH) support, lack of active counterparts, and lack of clear project guidelines. (CMP FY19755, p. 133.)

Female Volunteers in the Health Education Project performed activities complementary to those of the Environmental Sanitation Volunteers. They met with groups of local women for health education talks and demonstrations, stressing maternal-child health topics of particular importance to rural Paraguayans. Project objectives were at least partially achieved by most Volunteers in 1975. No Volunteer, however, was able to integrate a program into the activities of the health center in a meaningful or permanent manner. (CMP FY1977.)

Also in 1975, four new Volunteers were assigned at the last minute to the Rural Health Division of the Ministry, where it was believed they would have more meaningful work and greater support. This did not prove to be the case--one Volunteer transferred to another program and the others continued working as described for the first half of 1975.

For the remainder of 1975, Environmental Sanitation Volunteers continued their efforts while a new group of Volunteers entered Paraguay to assume regional responsibilities in organization and supervision of Paraguay sanitary inspectors. In addition, an audiovisual (A/V) technician began work at headquarters level. (Two cycles of recruiting had failued to produce an A/V technician; though candidates were identified, the invitations were declined. A generalist Volunteer was transferred from a rural post to assume the A/V role.) The results of this program were poor; new Volunteers were not accepted as supervisors and continued in the old role of sanitary inspector auxiliary. SENASA agreed that health education was the cornerstone of the Volunteer work, but offered little real support.

In their second year of service, Health Education Volunteers were to become more directly involved in community health efforts where particular needs had been identified. (See Appendix D.2 for a Project Description which exemplified activities at this time.) Training of health personnel, especially nonprofessionals such as empiricas, traditional midwives, was a key objective. New Volunteers were to concentrate their efforts in the rural health centers.

There was only limited success in meeting these objectives, however. One of the nine Volunteers developed a successful school education program, another provided health education in a nearby village with some success. Only two were able to develop a training course for traditional midwives. (CMP FY1977.)

Inadequate resources, including materials and transportation, remained a serious problem. Poor counterpart motivation and supervision were obstacles. More important was the continued under-utilization of Volunteers and an inability to institutionalize the health education approach. This stemmed from primarily organizational and financial problems in the MOH rather than a lack of trained personnel there.

Peace Corps took the initiative in using Volunteers in Environmental Sanitation/Health Education projects to demonstrate to the agency that the program's objectives were feasible. If MOH support was not forthcoming, PC/Paraguay was to seriously consider ending programming in the health sector. This management unit was ranked eleventh in priority of Peace Corps projects in Paraguay in 1976. (CMP FY1977.)

1976--The Turning Point

In 1976, there were nine Volunteers in the Environmental Sanitation Project. Three were working primarily in the construction of latrines and piped water systems until their COS in April-May. The remaining Volunteers continued to emphasize health education activities while working with sanitary inspector counterparts in water supply and latrine construction. These activities included talks, demonstrations, and community activities to teach health workers, community leaders, and selected rural populations basic concepts of public health. Efforts were made to adapt special techniques for use in school health.

By August 15, 1976, Peace Corps/Paraguay was to determine if the program as it was then structured could be sufficiently reprogrammed or strengthened to allow for a project in September 1977. By October 1976, PC/Paraguay was to have established revised goals for continued participation, if any, in the program or phase out all activities by the end of 1977.

In its eighth year, health programming by PC/Paraguay had reached its critical turning point. With nearly all the PCVs in health having servied in Health Education or Environmental Sanitation, these two projects had generated only four Volunteer requests for 1977.

The Health Education Project, due primarily to organizational priorities and finances, received little Ministry encouragement and less financial support. The few project staff members were all based in the capital and had no funds for travel. There was no Ministry-planned health education program and no Paraguayan workers for the rural areas. In spite of Peace Corps' assistance and encouragement over the years, there had been little or no change in Ministry activities in this area. Community involvement was the mainstay of Volunteer moral support. The people contributed labor and materials for projects. (Questionnaires.)

Volunteers assigned to rural health centers as health educators identified local health problems, defined their own jobs, and developed their own programs. The low-paid government physicians rarely had time for public health services and spent little time in the health center. Thus the Volunteers, with only Peace Corps training in health, received little in the way of encouragement or support. Lacking a structured job, many Volunteers became discouraged. The project was pronounced "unsuccessful." (CMP FY1977.)

Only three Volunteers remained in Health Education after May 1976. Two were in one rural site working with a nurse auxiliary midwife, assisting her in her clinical work, giving talks to mothers' groups and schools on health subjects, and assisting with the construction of a health center. The third Volunteers was transferred to Ministry headquarters in Asuncion to coordinate an immunization program and a dental health program. The CMP FY1977 notes that when these three cmpleted service in September 1977, they were not replaced. Thus the Health Education Project, ranked 13th of 14 in priority, was phased out. The inability of PCVs to integrate health education programming permanently into the health centers was the primary reason given for discontinuation.

According to the CMP FY1977, the situation for the male Volunteers in Environmental Sanitation at that time was slightly better since they were in the relatively well-organized, semi-autonomous department, SENASA. However, lack of financial resouces remained a serious constraint to effective performance. The well-trained auxiliary sanitary inspectors were the backbone of the organization in rural areas, but they were poorly paid and so their work performance was poor. Many had jobs on the side, while others left the agency after a short time. The budget of the agency did not allow effective supervision of these workers. It was hoped that assigning them as PCV counterparts would increase their effectiveness. Yet, after eight years of involvement, little change could be discerned in the MOH approach to environmental sanitation. The Environmental Sanitation program ranked number 11 in priority of 14 management units in late 1976.

Volunteer opinion, as expressed to staff in conferences and in mid-service and termination quesionnaires, had been consistently negative about these programs: Volunteers stated that the jobs were not meaningful or satisfying, and that Peace Corps should invest this effort in another sector. The occasional success story was attributable more often to an exceptional job site or a highly motivated and energetic Volunteer or counterpart rather than to program design.

The conclusion drawn in the CMP FY1977 was that there were formidable obstacles to the implementation of any public health program in Paraguay.

Reasons given included: country priorities stressing curative rather than preventive medicine; lack of systematic planning at the national level; no reasonably developed infrastructure on which health programs could be based; a dearth of trained medical and health auxiliaries (the majority of resources being used for constructing facilities and training highly qualifed professionals); and finally, a lack of financial resources to provide for materials and personnel to carry out health programs.

For these reasons, PC/Paraguay planned to reduce the Volunteer numbers in the Environmental Sanitation Project and made no further requests for the Health Education Project. A small continuing effort was projected only because the needs were great and there was hope for an improvement in conditions, an alternative programming plan, or some new concept to be introduced by the newly-appointed Peace Corps Director, a consultant, or possibly a new Programming and Training Officer.

One note of encouragement in the FY1977 CMP was the presentation by the NANEAP Regional Deputy Director at the January 1976 South America Country Directors Conference. This presentation listed three absolute criteria for successful health programming: drawing upon available skills, targeting the program toward specific tasks and geographic areas, and providing the program with strong support. PC/Paraguay was inspired to reprogram in FY1977 with the hope of producing a design that would once again bring Volunteer numbers to the 15-to-20 level. Steps in this direction included plans for a three- or four-week consultancy in health generalist programming in October 1976, after the new Peace Corps Director had settled in.

The CMP also suggested at this time that technical training beyond in-country capacity be centralized, perhaps through a new facility. It was also suggested that if support were not forthcoming from the Ministry of Health, perhaps USAID or international development loans could be provided.

1977-79, Renewed Energy

Apparently the inspiration of the Conference led to renewed efforts, for in 1977 there were 16 Volunteers programmed in the Environmental Sanitation Project, with an additional six brought in for 1978. During 1978, eleven Volunteers worked in environmental sanitation in rural areas, and when five new Volunteers were added in October, one was assigned to work with audio-visual aids at SENASA's headquarters in Asuncion.

Accomplishments for 1978 included the following. (CMP FY1980, p. 89.)

Water and Sanitation:

- improved water wells in three primary schools;
- extended piped water system to a health center;
- repaired water well pumps in health centers;

- assisted in construction of water tanks and extension of the system and housing connections;

- helped train 40 counterparts for sanitary work; and

- helped communities raise funds for construction of potable water systems.

Education:

- with counterparts, prepared and produced teacher workshops and developed teaching aids on topic of parasites;

- prepared and produced (with counterparts) workshops on food handling;

- gave children's classes on water sources, human waste disposal, and trash disposal;

- showed student groups and leaders 40 films on sanitation and health; and

- organized libraries on environmental sanitation subjects.

Among the difficulties encountered in 1978 were inconsistency of PCVs reporting to their agency, lateness of supplies such as latrine slabs, lack of transportation, and lack of audiovisual materials. PC/Paraguay in general noted a possible flaw in several projects: the absence of formal program agreements with Paraguayan ministries or host agencies covering the purposes and goals of the Volunteers and the mutual obligations of both parties. Because written agreements would set a tone for cooperation and a firm basis of understanding, it was felt that, if possible, the signing of such agreements should become a standard element in all major projects.

In 1978 and 1979, a new era began for Peace Corps and SENASA in collaborating with other agencies. With the development of large hydroelectric schemes, Paraguay was seen by funding agencies to have great growth potential. This translated into major assistance for water/sanitation activities. The World Bank loaned SENASA U.S.$6 million; the West German Government contributed a grant of DM 505,000, a loan of DM 4 million, and DM 1,630,000 in technical assistance; UNICEF gave a U.S.$920,000 grant; World for Peace provided U.S.$450,000 in a food grant; the World Health Organization (WHO) and the Pan American Health Organization (PAHO) provided technical assistance; the Municipal Development Institute cooperated with the Sanitary Councils; OPACI cooperated in programs of contamination control of water and urban cleanliness; and the Institute of Basic Sciences provided technicals and research equipment.

1979-81, Concentrated Action

In 1979, SENASA gave priority to a program called "Concentrated Action," involving the construction of piped water systems and sanitary facilities in the urban areas and, in the rural areas, the construction of public sanitary wells, sanitary protection of existing wells, and construction of sanitary latrines. The rural towns selected were to have fewer than 4,000 inhabitants. The urban works would be financed by the World Bank and rural area implementation would be assisted by UNICEF. Sanitation programs were to be established in colonization and border areas and in hydroelectric project areas. Volunteers could be assigned to any of these areas. (TAC, 1980.)

PC/Paraguay's goal for 1979 was to increase the effectiveness of projects involvement water supply and human waste/refuse disposal in rural communities, by increasing by 50 percent the minimum targets set by SENASA for each local inspector. Specific objectives included the construction or repair of 175 sanitary latrines; construction of 20 sanitary wells; sanitary projection of 30 existing wells; sanitary waste disposal in 200 homes, community centers, schools, markets, etc.; health education accompanying the promotion and construction of sanitary facilities and encouragement of new hygienic practices; assistance to counterparts in presenting two workshops per year on food handling (each to have an average of 40 participants and 10 hours' duration); and assistance to the Sanitary Councils in the promotion of piped water systems. This last goal was to be accomplished by providing in each community, as appropriate, a water fountain, elevated water tanks, installation of a piped water system, and home/school connections to the system. (Project Summary Sheet, FY1980.)

In 1979, the program was operating with 18 Volunteers in 16 sites with plans for expansion as resources permitted. The following are typical examples of the accomplishments of the 1979 Volunteers.

- A female Volunteer worked with the community committee in a compania providing water to 35 houses and a school. A 17-meter dug well was constructed, a windmill was installed, and a storage tank with a 2,000-liter capacity was built. The community contributed materials and labor and the rest was provided in collaboration with MOH and UNICEF.

- A male Volunteer worked in a compania with the environmental sanitationcommittee in setting up a piped water system. The Volunteer assisted in fundraising (USAID contributed) and taught a unit on potable water for seven teachers and 500 students at the school.

Other community projects received assistance from outside sources including Catholic Relief Services (CRS) and the Peace Corps Partnership Program. (Evaluation of PCV Participation, 1979.)

The results of the 1979 Volunteer Activity Survey* reveal dramatic turn of events from 1976, when PC/Paraguay was considering phasing out Environmental Sanitation and Health Education.

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*Volunteer Activity Surveys (VAS) were taken in 1979 and 1981 by the Planning, Assessment, and Management Information Office of ACTION. Questionnaires were sent to Volunteers worldwide to gather information on training, host country relations, support systems, and work assignments, among other topics.

A majority of Environmental Sanitation Volunteers felt their work was very useful and the effects of their project would continue when Peace Corps was no longer involved. The work satisfaction index was lower than the country average, but only one Volunteer was considering terminating early. Health Education Volunteers had similar responses except that their work satisfaction index was 44 points above the country average. (For more complete survey results, see Appendix D.3.)

In 1980, SENASA started water supply programs in 46 towns with fewer than 4,000 inhabitants. The communities were organized under Health Councils, responsible for the coordination of the community's participation in the program and for the administration of the systems. The communities bore 30 percent of the work's cost. CORPOSANA was at the same time carrying out water supply projects in seven cities in the interior of the country.

Environmental Sanitation and Health Education Projects Joined

In 1980, health education and environmental sanitation Volunteers were recruited under a single project title, Environmental Sanitation. The environmental sanitation technicians worked in the Concentrated Action Program as auxiliary sanitary inspectors for SENASA, supervised by area supervisors and the Department of Basic Sanitation. Volunteers and counterparts reported directly to the central office in Asuncion. Volunteers assigned outside the Concentrated Action Program worked with counterparts, but with little supervision. (TAC, 1980.)

In their education role, Volunteers provided technical information and assistance to individuals and groups on methods of sanitary waste disposal and potable water supplies and assisted in promotion and fund raising for sanitation projects. (In 1980, PCVs were involved in obtaining funding for PC Partnership Programs in nine USAID special projects.) They taught courses on prevention of water- and fecal-borne diseases to local elementary and high school teachers, and to other community groups such as 4-H Clubs, Mothers' Clubs, and youth groups. In these activities, the Volunteers worked with the local sanitation council in the transfer of educational and organizational methods. The ultimate objective was that the community learn about and be motivated to adopt new community development, health education, and project promotion approaches in order to continue to work effectively and independently after the Volunteers' departure.

In their technical role, Volunteers provided information and technical assistance in the improvement of existing wells; the proper protection of springs; the most common types of pumps for small community water systems, individual houses, or public wells; installation, operation, and maintenance of the various types of pumps including windmills; roof-guttering systems for rainwater catchment with accompanying water jars or tanks, slow-sand filters, and open well surface structures; installation and repair of hydraulic rams; design, construction, and maintenance of pit privies or improved latrines; and the relationship between water and health, including proper use and protection of water supplies. Counterparts learned organizational skills as well as technical innovations which they continued to use after Volunteers departed. (Questionnaires.)

In 1981, there were 19 Volunteers in the Environmental Sanitation Project with the same roles as the previous year. There was no difficulty recruiting Volunteers for this project. Each Volunteer worked with an average of 25 families, thus affecting a total of approximately 2,850 beneficiaries. Each Volunteer worked with either an MOH-trained and employed counterpart or an informal counterpart, frequently a Ministry-trained auxiliary. A number of PCVs experimented with their own handpump designs and fabricated sanitary slabs for latrines. Some explored the possibilities of wind-powered water systems. (CMP FY1983-84, p. 38.)

Volunteers worked on projects with German Development Bank, World Bank, or UNICEF support. Some $8,100 in USAID-financed special development authority funds was disbursed for excavation and protection of wells, pump installation, and construction of sanitary latrines. In a 1981 evaluation, SENASA officials and counterparts were very appreciative of Peace Corps Volunteer participation in water and sanitation efforts. PCVs were generally satisfied with the agency, although there was still frustration with the amount of time for implementation of requests, lack of material support, and a tendency to view Volunteers as community organizers rather than technicians in water and sanitation. Another frustruation expressed by Volunteers was the amount of time spent fund raising when working on World Bank and German Development Bank projects. (See Appendix D.4.) Redesign and negotiation with the agency were slowly resolving this problem.

The 1980-81 Volunteer Activity Survey confirmed the evaluation findings. Volunteers in this project were reported to be happy though frustrated by a lack of material support. Six of 15 Volunteers were considering extending. (See Appendix D.5.)

Accomplishments for the Environmental Sanitation Project included 4,845 sanitary inspections and reinspections, 346 sanitary latrines built and 153 latrines repaired, 53 wells excavated, 18 water pumps installed, 16 springs protected, and 460 trash pits excavated. Work continued on internationally funded piped-water projects. The health educators made 4,362 home visits and conducted 1,421 interviews, taught 76 classes, attended 296 health commission meetings, and carried out six potable water and antiparasitosis education programs with counterparts. (CMP FY1983-84, p. 40.)

1982, New Directions

A 1982 consultant assessment discussed Volunteer activities, training, and job frustrations. (Victurine, 1982.) It was apparent that the Volunteers preferred assignment to rural sites rather than large, long-term urban projects. In the urban pojects, Volunteers and communities were under unrealistic schedule pressures from the funding agencies; there was not as much Volunteer-community interation; and results were often seen only after four to six years when the Volunteer's term of service had long since ended. In the rural sites, Volunteers were involved in independent projects with short-term, tangible results, working closely with the people at all stages. According to current Acting PCD Kelly, Volunteers expressed greater satisfaction in working in basic sanitation--latrine construction, well improvements, and better garbage disposal systems--than in working in the less personal, more long-term urban projects. (See Appendix D.6.)

A further concern expressed in the FY1983 CMP was lack of Peace Corps staff to support water/sanitation activities. A PCV-Program Manager ratio of 50/60 to 1 made it difficult to provide the necessary support to PCVs in the field. Since budget and/or staff increases were not forthcoming from Washington, a reduction in Volunteer numbers was planned for the following years in health projects to alleviate the problem. (CMP FY1983-84, p. 41.)

Environmental Sanitation Project Assessment and Redesign

In order to address problematic issues and involve both Peace Corps and SENASA in the process, a mini-conference was held on August 13, 1982, in Asuncion. The conference was attended by the Peace Corps Co-Directors, th Assistant Peace Corps Director for Health (APCD/Health), Volunteer coordinators, and three program chiefs from SENASA. The agenda involved a discussion of the current program and programming goals for the future. Moreover, an open and useful dialogue was established between the agencies. (Victurine, 1982.)

From the conference, preliminary programming guidelines were developed.

- Volunteers would work in priority rural areas which could not yet be served by SENASA personnel due to human resource shortages. Additionally, PCVs would work in rural communities in an area where SENASA hopes to drill communal wells with equipment provided by UNICEF.

- PCVs would not have an official SENASA counterpart in the same community, but would work with organized commissions, school teachers, local authorities, or with people interested enough to involve themselves.

- PCVs would train their unofficial counterparts in various activities such as latrine slab and spring box construction; the manufacture, installation, and maintenance of handpumps; etc. This training would be expected to produce a real technology transfer. This transfer could even result in income-generating activities as people charged fees for the services rendered in making slabs or repairing handpumps.

- Agencies would participate jointly in conferences and training programs. SENASA would ask Peace Corps to participate in certain aspects of their training program for inspectors. SENASA would ask a PCV to demonstrate the manufacture of his PVC handpump and the APCD/Health to speak to the inspectors about Peace Corps. SENASA project directors and supervisors would be invited to actively participate in Peace Corps training and job conferences.

As a result of these and following discussions, in November 1982 the Environmental Sanitation Project was evaluated and redesigned with all PCVs in the project and agency office directors and provincial supervisors participating in the process. Not only were Volunteers moved to more remote, underdeveloped areas, but some tasks were changed as well. Peace Corps involvement in urban piped-water systems was reduced, and the agency agreed that it would be taking best advantage of a useful resource to place PCVs in areas where SENASA had no employees. (CMP FY1984, p. 33.) The Volunteers became semi-autonomous and, because basic sanitation projects used local supplies, were no longer dependent on SENASA for provision of tools and materials. (Kelly, 1983, p. 3.)

Another significant change with the new design was that the "official" counterpart of the PCV was to be his regional supervisor. The supervisor would visit the Volunteer's site on a quarterly schedule to review work and work plans, demonstrate to the community the relationship between SENASA and the PCV, and offer technical assistance. However, the day-to-day counterparts would be villagers (not SENASA employees)--carpenters, plumbers, teachers--who demonstrated particular interest or capability and who could carry on when the PCV left. The PCVs would make their unofficial counterparts known to the agency so they could work together when SENSA services were extended to the community. An effort was to be made to help some of the counterparts to set up small businesses to construct latrine slabs, well tops, and handpumps. (CMP FY1984, p. 34.)

SENASA has grown increasingly more positive about the relationship with PCVs. The redesign and PCV participation has improved PCV satisfaction a great deal. (CMP FY1984, p. 35.)

By December 31, 1982, there were only six PCVs and one PCV coordinator in Environmental Sanitation, all of whom were to COS in August of 1983. Ten new PCVs were to arrive in July 1983. The program had been phased down to reduce the Program Manager's Volunteer load from 60 to a more manageable 30. (Efforts to reduce the ratio by increasing the staff numbers had been unsuccessful.) SENASA continued to concentrate on piped-water systems, financed by the World Bank and the German Development Bank, in towns of over 4,000 population. Peace Corps, by the agreement negotiated that year with SENASA, was concentrating more and more on basic sanitation at the compania level. (CMP FY1984, p. 12.)

Rural Health Project (1979-present)

Collaborating agencies: Peace Corps, Ministry of Public Health and Social Welfare (MSPBS), Department of Rural Health, Pan American Health Organization (PAHO), Inter-American Development Bank, USAID.

In 1981, there were 29 Volunteers with roles as rural health educators in the Rural Health Project begun in 1979. The goal of the project was to improve the capacity of the Ministry of Public Health and Social Welfare (MSPBS) to deliver low-cost rural health services. The project's objectives emphasized education and preventive care. (CMP FY1983-84, p. 34.)

Qualifications for the generalist Volunteers in this project were the same as for PCVs recruited to be Environmental Sanitation health educators. These Rural Health Volunteers also worked in health posts in small rural communities, but under the aegis of the MSPBS. Nurses were recruited to dispense medicine, administer vaccinations and first aid, and provide pre- and post-natal care. There was some difficulty recruiting nurses, but none finding generalist Volunteers. Volunteers received four weeks of Stateside technical training followed by ten weeks of incountry training in language, cross-culture, and job orientation.

The MSPBS's plan for expanding health services in six zones of Paraguay included building and equipping 76 health posts, seven health centers, and seven regional health centers, as well as training 3,000 volunteer community members as health workers in the smallest rural areas. The MSPBS was assisted in this plan by PAHO through a loan from the Inter-American Development Bank. USAID provided small special development fund grants for materials, medicines, and latrines until the fund was phased out in 1981.

Volunteers worked as public health educators working with nursing auxiliaries at the health posts. Stressing preventive medicine, these Volunteers had basically the same role as the Environmental Sanitation health educators in working with individuals and communities. Additionally, they focused on nutrition and maternal-child care, and participated in the training of the volunteer health collaborators. Generalist Volunteers did not do clinic work or give injections or vaccines, but provided the educational component of vaccination programs, planted demonstration gardens, and developed health libraries.

Each PCV maintained close contact with approximatey 25 families, reaching a total of approximately 4,500 beneficiaries. Most of the PCVs in the project were women, as were most of the beneficiaries. The counterparts were usually women also because women were normally trained as rural health workers and midwives.

Results of Volunteers' efforts in 1981 in the Rural Health Project are shown in the table below.

Clubs Attended	Number
First Aid	36
Mothers	7
Midwives	4
Handicrafts	10
Nutrition	37
Garden	6
Children's	2
School/Family Gardens Planted	79

Committees	Number
Health (Attended)	115
Fund Raising (Started)	12
Facilities Constructed	
Slabs for Latrines	29
Sanitary Latrines	12

MSPBS satisfaction with PCVs was high, according to interviews carried out during a 1981 evaluation. "Counterparts in general were highly impressed with PCV dedication and service, perceived the need for continuance of PC participation in the health sector, saw PCVs as effective agents in fomenting cooperation, saw PCVs' efforts as complementing others, and believed that Volunteers affected the widest variety of host country people." (CMP FY1983-84.)

Volunteer satisfaction with the agency was highly favorable overall. PCVs were closely monitored by means of quarterly work-plan interviews and a minimum of three official site visits by staff. According to the 1980-81 Volunteer Activity Survey, eight of 27 Volunteers were considering extending for a third year. (See Appendix D.5.)

PC/Paraguay viewed the Rural Health Project as active, visible, and progressively working towards the realization of program goals and objectives. It was to be reduced in Volunteer numbers, however, to allow for more effective program management--the PCV/PM ratio being 50/60 to 1.

The 1982 Rural Health Project had 22 Volunteers including four nurses, seven health educators, three social workers, and one PCV coordinator. Their accomplishments for 1982 are shown in the chart below.

Community Promotion Activities	
Home visits	3,325
Interviews	1,128
Home sanitary inspections	1,076
Reinspections of home	1,990
Educational talks in grade schools, high schools, and communities	158
Commissions meetings	223

Projects Undertaken	
Latrines constructed	327
Latrines repaired/made sanitary	93
Latrines improved	115
Latrine slabs fabricated	132
Wells protected for sanitation	27
Wells rehabilitated	52
Springs protected by spring boxes	7
Spring boxes repaired	3
Pumps installed	57
Pumps repaired	39
Trash pits dug	411

Health Job Conference and Project Redesign

As a result of a Health Job Conference held in October 1982, the focus and direction of the project changed. In the process of redesign it was decided that placing health PCVs in situations where a trained Paraguayan had been working for some time was a poor use of resources, when many rural areas had no health services whatsoever. In negotiations, the Ministry and Peace Corps determined that Peace Corps should focus its efforts on zones where the agency had plans to expand within a year or where there was a recently graduated health auxiliary who was just beginning his or her service. To date, Peace Corps continues to use PCV preference for rural postings to the advantage of the agency in its effort to reach unserved populations. These Volunteers are training nonformal counterparts--teachers, midwives, health committee members--for the eventual expansion of SENASA services. (CMP FY1984, p. 28.)

A second key part of the redesign was negotiation with the Ministry to agree to limit PCV placement to a few select areas (zones) where sites would remain until minimal services are provided for the majority of the population. This would maximize the use of Peace Corps' limited resources. Peace Corps/Paraguay felt that a job well done in two or three provinces was preferable to a little effort scattered throughout the country. (CMP FY1984, p. 29.)

Equally important was an agreement that the Department of Rural Health in the Ministry would work with Peace Corps and SENASA to place a team of PCVs, including a nurse, health, educator, and environmental sanitation worker, within reasonable geographic distance of each other so that they could draw upon one another's expertise to better serve their communities. If Volunteers could draw upon one another's skills, they could get the whole job done while concentrated on their own areas of expertise. The pilot effort would demonstrate the advantages of an integrated approach to health/sanitation problems.

This integrated, zone-level approach is based on the low-cost rural delivery system or village health worker model. The idea is to use nurses as providers of technical guidance and coordination at selected health posts in order to develop community-level networks of health extensionists and informal collaborators. The health extensionists would then coordinate their own network of voluntary collaborators and groups in the areas surrounding their own sites. This is a new concept in Paraguay and will take time to gain acceptance. Gaining recognition and some sort of compensation for voluntary collaborators will be a challenge. (CMP FY1984, p. 62.)

The complementary programming by zone between the Department of Rural Health, SENASA, and Peace Corps continues. The clear definition of roles and functions between SENASA and Peace Corps, with Volunteers in basic sanitation at the compania level and the agency's efforts focused on piped water systems in the larger towns, will be maintained for the next two to three years.

MSPBS and Peace Corps Agreement

In May 1983, a five-year agreement was signed for the first time between the MSPBS and Peace Corps/Paraguay formalizing collaboration. Program objectives for environmental sanitation, rural primary health care, and sanitation education were stated, meeting an expressed need for a national policy and official program support. (Questionnaires.) Roles were defined for Volunteer recruitment, placement, support, site selection, supervision, and termination. (Agreement between MSPBS and PC/P, 1983.) The Agreement states that projects will be managed jointy by MSPBS through its coordinators, the Department of Rural Health/SENASA, and PC/Paraguay's Health Program Coordinator. (CMP FY1984.)

The current APCD/Health and his predecessor worked for SENASA prior to their employment with Peace Corps. The formal and informal relations that they formed with SENASA functionaries have facilitated dialogue between the two institutions. (Kelly, 1983, p. 2.)

As of this writing, PC/Paraguay recommends maintaining a long-term level of between 25 and 35 Volunteers in Rural Health and Environmental Sanitation with an average ratio of 2:1. Rural Health is to have 18 to 22 PCVs, with six to eight nurses and 12 to 14 health educators; Environmental Sanitation Volunteers are to number from eight to 12. (CMP FY1984.)

PEACE CORPS/PARAGUAY

Collaboration

With the phase-out of USAID operations in Paraguay in FY 1984, Peace Corps will be the sole bilateral U.S. representative in the development community in the country. Quality and professionalism will be increasingly important. Peace Corps will also need to respond to a technical assistance gap which will only be partially filled by other bilateral and multilateral donors, especially in the development of organization capacity and delivery systems in rural communities. (CMP FY1983-84, p. 70.)

Peace Corps/Paraguay does not normally collaborate directly with external agencies. Peace Corps Volunteers work in projects administered by SENASA which receives collaborative assistance from such large donors as UNICEF, the German Development Fund, and the World Bank. Peace Corps has collaborated directly with UNICEF on two occasions. One Volunteer received substantial support for two windmill projects she initiated. UNICEF donated the windmills and provided the service of a well-drilling rig. In another project, UNICEF subsidized the per diem of the five SENASA functionaires who attended a Peace Corps-sponsored windmill workshop in Asuncion in 1983.

UNICEF funding for SENASA is presently approved until 1985-86. UNICEF provides handpumps and small drilling equipment to SENASA and is particularly interested in promoting small piped-water systems in rural areas.

The German Development Fund is lending money to SENASA for well-drilling and piped-water system installations in northern Paraguay. The systems will include diesel motors, elevated storage tanks, and distribution systems. The projects should be completed by 1986.

In 1981, the World Bank approved an $11.8 million loan for water supply and basic sanitation services to poor rural communities in southeastern Paraguay. The $20.8 million project is scheduled to be carried out by SENASA over four-and-one-half years. The project is to provide chlorinated water to approximately 73,000 people in 49 rural communities through construction of new water supply systems or extension of existing ones. The scheme includes assistance in construction of waste disposal systems; provision of equipment and tools for regional laboratories, well-drilling operations, and community repair shops; and provision of trucks for SENASA's construction supervision. Educational and promotional programs at the village level are part of the project. (Victurine, 1982.)

Community Involvement

Community members have a part in the planning of PCV activities through their involvement on Pro-Health Committees, Running (Piped) Water Boards, and small Sanitation Committees. When sanitary improvements are planned and implemented in the school or religious meeting places, the Pro-School or Pro-Church Committees often have a part. All Volunteers complete a community study prior to initiating any projects. Part of the community study includes gathering the townspeople's perceptions of the needs of their community and how those needs can best be met. Community members also provide labor and materials for projects. (Kelly, 1983, p. 2.) Volunteers expressed that communities provided an essential factor to project success--a high level of moral support.

Appropriate Technology

Paraguay has contributed a number of innovations, especially in the water/sanitation sector. (Victurine, 1982.)

- Two PCVs have designed and manufactured handpumps using local materials.

- Two small-scale windmill systems have been installed, providing water for communities with populations between 200 and 300. Each system consists of a hand-dug well, a windmill pump, an elevated storage tank, and public standposts. To date (the systems were installed at the end of 1980) the systems are functioning satisfactorily. Maintenance is provided by the community and no major problems appear to exist. Larger storage capacities may need to be considered soon to ensure adequate water supplies for times when the wind does not blow strongly enough or at all.

- In some places in Paraguay, farmers, and in one case a PCV, have installed impulse pumps (hydraulic rams) for irrigating vegetable gardens. The PCV's impulse pump installation was assisted by funds from CRS. The pumps were purchased from Brazil.

At present there is strong interest among forestry PCVs in the extension program for methods of irrigating tree nurseries. Easy-to-make, inexpensive hydraulic rams could find a great acceptance among these Volunteers, once they are familiar with the technology. At least one PCV from Paraguay will be attending a seminar on hydraulic rams in Costa Rica. Knowledge he brings back to the country will be shared with other PCVs and counterparts.

Women in Development

Since rural water sypply, sanitation, and family health are primarily the concerns of women in Paraguayan culture, women are the main beneficiaries of these projects.

Paraguayan women are involved in Peace Corps water/sanitation projects in the following ways. (Kelly, 1983, p. 3.)

- School teachers (nearly always women) participate in and sometimes help organize sanitary education workshops.

- Women participate in vegetable gardening projects.

- Mothers and young women attend sanitary and general health talks in the community.

- In the last five years, two women have been PCV counterparts.

- In home visits to promote running water projects or basic sanitation, the majority of the Volunteers' contacts are with women because the men are out in their fields.

- Women select sites for stand pipes.

However, as yet, very few women are members of Running Water Boards.

In informal discussions, sanitation Volunteers have said that they think women have the greatest influence on home improvements. Paraguay women themselves perceive the benefits of those projects as the following.

- They and their children will have healthier lives.
- They save time hauling water.
- They have more water available for home gardens and ornamental plants in times of drought.
- Kitchen tasks become more convenient as water supply is more accessible.

Training

Because Paraguay is a bilingual country, most Volunteers must learn to speak both Spanish and Guarani if they are to perform effectively. The pre-service and in-service language training objective is to assist the Volunteer to reach an FSI 3 level in Spanish and/or Guarani after 12 months incountry. Pre-service training emphasizes Spanish until an FSI rating 1+ is attained and then intensive training in Guarani follows. In-service language training focuses on Guarani.

Peace Corps/Paraguay opted for Stateside or third-country centralized training in technical areas. Problems had been noted in the quality of incountry technical training prior to 1977, due to over-reliance on experienced Volunteers, themselves generalists, to provide technical training for generalist trainees. Incountry technical training had been inadequate because there were few English-speaking Paraguayans with appropriate knowledge and training skills. If technical training could be provided in the United States or a third country, along with Spanish language training, PC/Paraguay would be able to reduce incountry training to six to eight weeks of Guarani, cross-culture, and orientation to volunteerism. (CMP FY1979.)

As late as 1980, a 12-week incountry training program included community development skills, a review of Spanish and intensive instruction in Guarani, health education, and cross-cultural skills. Technical orientation was provided by SENASA. Family live-in experience and field trips were included. Intensive in-service training occurred three months after swearing in.

In 1981, training for ten PCTs began with six weeks of Stateside training (SST) at Pingree Park, Colorado, in well protection, latrine construction, piping for piped water systems, use of hydralic rams, and other technical skills. This was followed by eight weeks of incountry training in Spanish, Guarani, and cross-culture. Training incountry also included a family live-in experience and two field trips. Three months after swearing in, Volunteers attended three weeks of special workshops to fill in any gaps.

Later in 1981, nine Volunteers were skill-trained at the Gallup, New Mexico, training center. The five-week technical training program followed the skill-training objectives found in the Training Section of this document.

The core staff of the Stateside training program included an engineer and a sanitarian from the Indian Health Service, and a process training specialist. Several RPCVs also assisted with the Stateside training.

In 1982, PC/Paraguay made no requests for SST because an evaluation of the program was being conducted by PC staff. The consultant provided through the Water/Sanitation Sector Specialist in Washington recommended that in-country training by contractor at the training center in Villeta (Paraguay) provide ten weeks of language, cross-culture, and less time-consuming technical components. This would be followed by an intensive three weeks of technical training which would take place primarily in the field, with Villeta serving as the base of operations. The intensive technical training was to be conducted as much as possible in Spanish so that PCVs would not lose what language they had learned in the first ten weeks. SENASA counterparts could also participation if instruction were in Spanish. (Victurine, 1982.)

In 1983, PC/Paraguay requested that the training contractor take on more responsibility for technical training, training coordination, and management, which until then had been handled by Volunteers and PC staff. Peace Corps continues its role in selection, counseling, and site placement.

ANALYSIS*

Peace Corps/Paraguay experienced a long history of health programming frustrations. But after 15 years of determination, PC/Paraguay is now operating a successful, integrated approach with Paraguayan Government recognition and support, in collaboration with the Ministry of Public Health and Social Welfare.

Aspects Contributing to Project Successes

- The creation of SENASA improved the definition of roles and the MOH's supervisory capacity.
- The health education/environmental sanitation programs were undertaken with the poor rural population, particularly involving women. Volunteer satisfaction increased as PCVs were posted in companias rather than urban settings.
- Female Volunteers were involved in the health education programs, which enabled them to make better contacts with rural households.
- Skill-trained generalists were appropriate for the role Volunteers were filling in projects with an emphasis on community development and use of local materials and appropriate technology.
- By 1979, financial support of environmental sanitation and health education programs increased from outside donors, and the resources available made conditions more viable for project success.
- At this time, the Peace Corps staff were aware of prior difficulties and were getting assurances from the MSPBS that support would be better. Peace Corps staff members were also investigating proposed posting sites more carefully.
- Local community participation increased with time and was rated very highly by Volunteers. The future sustainability of this program was also viewed very positively because of local motivation. Projects were originated and completed by village committees.
- The integration of water supply, sanitation facilities, and health education aspects of these programs has been effective.
- Volunteers were satisfied with tangible, short-term results; long-term effects are now verified.

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*By Joseph Gadek and Diana Talbert.

- Volunteers' familiarity with Spanish and the local Guarani language gave them access to the rural people who were the beneficiaries of these programs.

- Volunteers were able to live at the community level and work directly with the beneficiaries.

- The use of indigenous materials in construction activities made the maintenance of installations more manageable on a local basis.

- Continuity of PC/Health programming staff and the fact that they were host country nationals with SENASA experience helped the project.

- Peace Corps staff were continually reassessing their programs in dialogue with MSPBS and Volunteers.

- Peace Corps decided to concentrate its efforts in certain regions of the country to focus and integrate resources. If they are successful in this pilot approach, the Government of Paraguay will be more likely to replicate the system. This concentration also enables Peace Corps staff to more efficiently manage the Volunteers in these areas.

- The signing of an agreement between the MSPBS and Peace Corps/Paraguay defining roles and responsibilities strengthened the collaborative process and potential for success of health projects.

Aspects Hindering Project Successes

- Initially, the health education/environmental sanitation project sites were selected without adequate assurances for:
  (1) resources for support of programs;
  (2) transportation; and
  (3) counterpart support of programs.

- Initially, lack of supervisory structure and viable job descriptions left the Peace Corps Volunteers to set up their own programs.

- While the Government of Paraguay did realize the importance of health education and environmental sanitation, it could never fully support these programs in annual budget considerations.

- Rural placement of Volunteers limited use of outside materials as well as supervisory support and site visits, due to remoteness and poor road conditions.

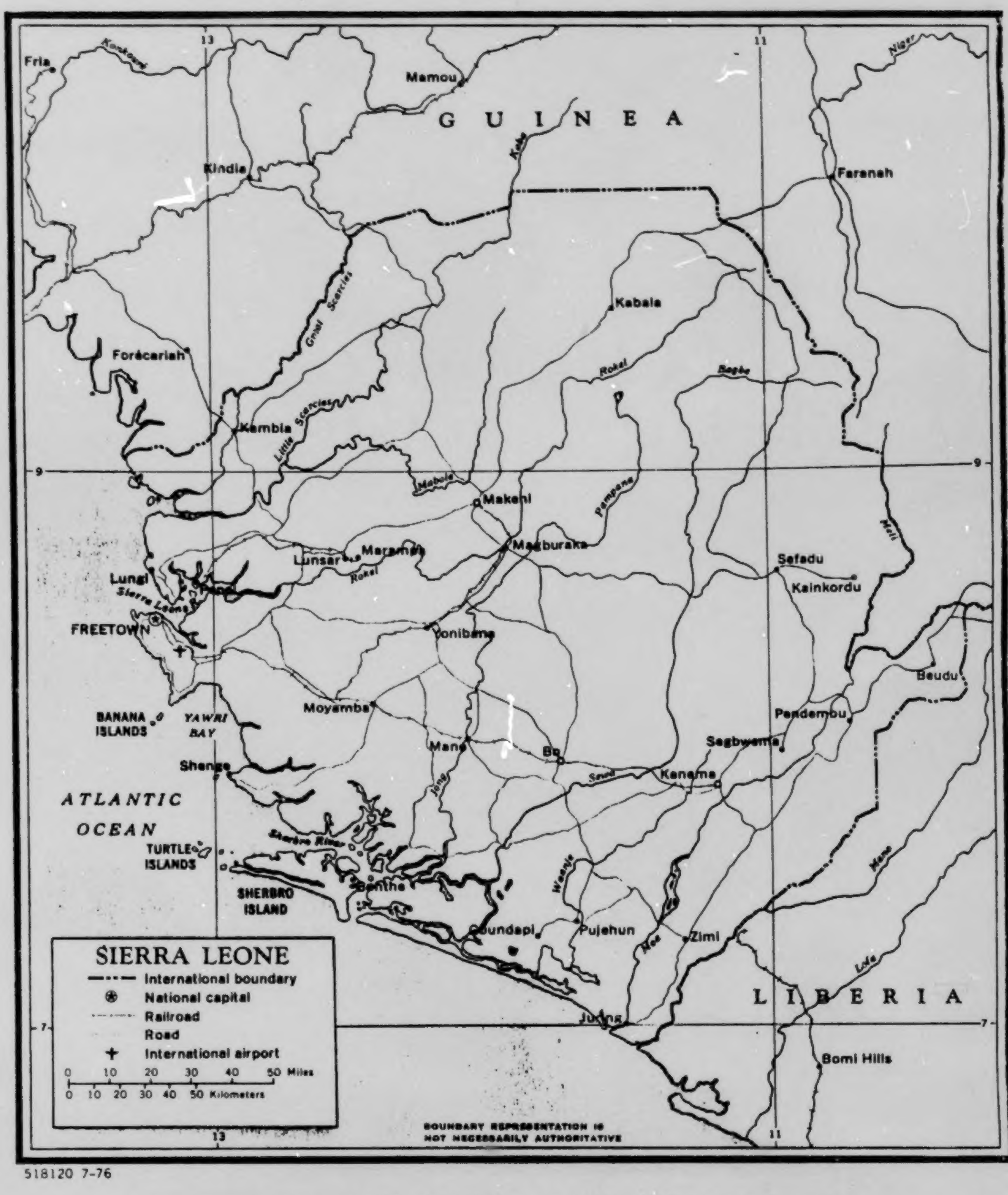
- Large piped-water projects funded from outside sources tended to be urban and long-term. Volunteers preferred rural sites where accomplishments could be seen within their two-year stay.

- The Volunteer to staff ratio of 60:1 was too high for efficient Peace Corps' administrative capacity; it was difficult to manage so many Volunteers in wide geographical distribution.

- Training for maintenance of installed water supplies--i.e., handpumps, gravity-fed systems, and submersible pump systems--was not addressed adequately.

- Counterparts did not always consider their role with SENASA a full-time job.

REPUBLIC OF SIERRA LEONE
CASE STUDY AND ANALYSIS


SIERRA LEONE
International boundary
National capital
Railroad
Road
International airport
0 10 20 30 40 50 Miles
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GUINEA
LIBERIA
ATLANTIC OCEAN
Fria
Konkouré
Mamou
Niger
Kindia
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Great Scarcies
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Rokel
Bagbe
Kambia
Little Scarcies
Mabole
Makeni
Pampana
Magburaka
Moa
Lunsar
Marampa
Rokel
Safadu
Kainkordu
Lungi
Sierra Leone R.
FREETOWN
Yonibana
Beudu
BANANA ISLANDS
YAWRI BAY
Moyamba
Pendembu
Segbwema
Mano
Bo
Shenge
Jong
Sewa
Kenema
Sherbro River
TURTLE ISLANDS
Bonthe
SHERBRO ISLAND
Waanje
Mano
Gbundapi
Pujehun
Zimi
Moa
Lofa
Jurang
Bomi Hills
BOUNDARY REPRESENTATION IS NOT NECESSARILY AUTHORITATIVE
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11
9
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518120 7-76

Note: Sierra Leone is approximately 7,700 kilometers (4,800 mi.) from Washington, D.C.

From Background Notes: Sierra Leone, United States Department of State, Bureau of Public Affairs, November 1980.

COUNTRY BACKGROUND*

Geography

SENEGAL
GUINEA-BISSAU
Freetown
SIERRA LEONE
Atlantic Ocean

Sierra Leone, with an area of 72,325 sq. km (27,925 sq. mi.), is located in the eastern half of the West African littoral. It has a 340-kilometer (210-mi.) Atlantic coastline, a southeast border with Liberia, and north and northeast borders with Guinea. The capital city is Freetown (pop. 500,000); provincial capitals are Bo (42,216), Kenema (33,880), Makeni (28,684).

Three types of terrain characterize Sierra Leone: a coastal belt of mangrove swamps 96 kilometers (60 mi.) wide; stretches of wooded hill country; and an upland plateau, with mountains of 1,220 to 1,830 meters (4,000-6,000 ft.) near the eastern frontier. Bintumani Mountain in this range is the tallest peak in West Africa.

Sierra Leone has a tropical climate. The average temperature is 26°C (80°F). Normal rainfall is heavy, and along the coast as much as 500 centimeters (200 in.) may fall in one year. A dry season lasts from November to April and a wet season makes up the remainder of the year with the maximum precipitation from July to September. Early in the rainy season, rainstorms build up and finally break in late afternoon and evening; later in the season, light rain falls all day.

People

In 1980, the estimated population of Sierra Leone was 3.5 million, with 42 percent under age 15, and an annual growth rate of 2.6 percent.

The indigenous population of Sierra Leone is comprised of 18 ethnic groups. The Temne in the north and the Mende in the south are the largest of these groups. About 600,000 persons are members of a group called the Krios. In addition, there are about 5,000 Europeans and Asians.

English is the official language; however, Krio, Mende, Temne, and nine other indigenous languages are spoken.

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*Excerpted from Background Notes, U.S. Department of State, Bureau of Public Affairs, July 1982, and Peace Corps/Sierra Leone Country Management Plans.

N.B. Special thanks to Craig Hafner for history and perspective in this case study.

The various groups of Sierra Leoneans have been noted for educational achievement, trading activity, entrepreneurial skills, and art and craftwork--particularly woodcarving. Many are part of larger ethnic networks extending into several countries, which helps to link West African states in this area.

Government

Sierra Leone gained independence on April 27, 1961. Under the 1978 constitution, Sierra Leone is a republic. The President is the Chief of State and Head of Government. The President and the Cabinet exercise executive authority. The President is elected as the leader of the only recognized constitutionally permitted party (since 1978) and assumes the office for a seven-year term.

The President appoints First and Second Presidents, as well as Cabinet Ministers, from among the members of the national legislature.

Legislative responsibility is vested in a unicameral House of Representatives (formerly called the Parliament). This legislature consists of 104 seats: 85 popularly elected members, 12 paramount chiefs elected by traditional councils from their respective districts, and seven members appointed by the President. The House is elected to a five-year term, but elections may be called earlier, reflecting the parliamentary tradition.

The judicial system comprises a Supreme Court, Court of Appeals, and High Court of Justice, with judges appointed by the President. There are also Magistrates' Courts. These local courts administer traditional law, with lay judges and procedures that do not require legal counsel.

For administrative purposes, Sierra Leone is divided into three upcountry Provinces--Northern, Southern, and Eastern--and the much smaller Western Area. The Western Area is divided into greater Freetown and three rural districts. A separate, partially elected council and a mayor chosen by the council govern Freetown. Each of the three upcountry Provinces is adminstered by a cabinet-rank Minister, assisted by a Provincial Secretary. The three provinces are divided into 12 districts. Each district is headed by a District Officer who is responsible to the Provincial Secretary. The districts of the provinces are further subdivided into 148 chiefdoms. Each chiefdom is headed by a Paramount Chief who is elected by the chiefdom. The chiefdom is further divided into sections headed by section chiefs who are responsible to the Paramount Chief. (Manpower and Training Survey, 1979, p. 2.)

There is universal suffrage for adults over age 21.

Economy

Sierra Leone's GDP (1978-80) was estimated at $601.3 million, with an annual growth rate of 1.9 percent. Per capita income for 1981 was estimated at $320.

Sierra Leone is primarily an agricultural country; 30 percent of its land is arable, and 7.6 percent is cultivated. Agricultural products include coffee, cocoa, ginger, rice, cassava, and palm kernels.

Although about 75 percent of Sierra Leone's people derive their livelihood from agriculture, it accounts for only 30 percent of national income. Government development plans now give agriculture the highest priority, directing government efforts toward increasing food production as well as cash crop improvement and upgrading small farmer skills. In addition, the government works with several foreign donors, including the United States, to operate integrated rural development and agricultural projects. Despite increased world prices for coffee and cocoa in the late 1970s, agricultural and rural development efforts are essential to ensure a healthy base for the society and economy of Sierra Leone.

Because of Sierra Leone's mineral resources, the mining sector--principally diamonds--has traditionally played a central role in the economy. The quantity of mined gem and industrial stones is declining, but high world prices and the quality of the stones have maintained diamonds as the leading export. Diamond-mining operations are carried out by the National Diamond Mining Company (Diminco--51 percent government-owned) and by licensed diggers and dealers operating under an Alluvial Diamond Mining Scheme. The United States is the final market for about one-half of total production.

Sierre Leone has the world's largest deposits of rutile, a mineral used in paints and metal alloys. Sierre Rutile, Ltd., jointly owned by the government and two U.S. firms, Bethlehem Steel and Nord Resources, began mining operations near Bonthe in early 1979, reaching about 50 percent of capacity or more by mid-1980. In addition, large bauxite reserves are known to exist in the northeast part of the country near Pepel, and Alusuisse is currently exploiting deposits 128 kilometers (80 mi.) south of Freetown.

Trade and investment in Sierra Leone are encouraged by the government. In recent years, the country has had serious balance-of-payments and budgetary deficits. New taxes and restrictions on expenditures and imports were imposed in early 1977. Standby credit arrangements with the International Monetary Fund (IMF)--the latest in February 1980--and higher export prices have partially eased the pressure on foreign exchange reserves. Expenses incurred for the July 1980 meeting of the Heads of State of the Organization of African Unity (OAU) in Freetown, however, introduced new budget and financial strains.

Sierra Leone is a member of the Economic Community of West African States (ECOWAS), and with Liberia and Guinea forms the Mano River Union (MRU), a customs union which also designs and implements development projects. The MRU is intended to promote eventual economic integration.

The Physical Quality of Life Index (PQLI)* in Sierra Leone is 31. The PQLI for PC countries in the Africa Region ranges from 17 to 73; Sierra Leone ranks 13th of 24.

Water/Sanitation

Rural Water Supply

Approximately 75 percent of Sierra Leone's population is rural and depends on streams, springs, shallow wells, and swamps for water supply. Such sources of water are used not only for the collection of drinking water but also for washing, laundering, fishing, and even urinating and defecating. A

1979 water-quality report found 95 percent of water sources tested had recent fecal contamination. No water sources tested met WHO standards. Lack of potable water accounts for the high incidence of water-borne diseases, including cholera, diarrhea, typhoid, para-typhoid, dysenteries, and worm infestations.

Water is not only unclean; it is often inaccessible. In some cases women and children travel long distances--4 to 20 km--to get water, especially in the northern areas during the dry season from November to May. (Manpower and Training Survey, 1979, p. 3.)

The Survey notes (p. 7) that for the development of rural water supplies, the government has established the following objectives.

- Provide a source of clean, potable, and dependable water within a distance of 2.4 km (1.5 mi.) of every village of more than 200 inhabitants by the year 2000.
- Where applicable, provide a piped water supply to rural areas by 1991, so that all people will have ease of access (i.e., a distance of 1/2 mile or 800 meters) to a public domestic water point.
- Place great emphasis on the development of shallow wells where ground water of acceptable quality is available and where it can be demonstrated that development of wells represents the least cost solution.
- Place great emphasis on community participation: villagers have to absorb part of the capital and recurrent costs of construction, operation, and maintenance. They provide sand, gravel, and unskilled labor.

Sanitation

The Manpower and Training Survey (p. 4) states that 25 percent of all deaths occur among children under one year of age, and 50 percent among children under five years of age. Infectious or communicable diseases account for over 50 percent of all illnesses and deaths. Malaria, tetanus, measles, respiratory diseases, helminth infections, tuberculosis, schistosomiasis, onchocerciasis, anemias, and diarrheal diseases are the major causes of death.

Most diseases result from unhygienic conditions, polluted water supplies, and overcrowding. To effectively combat these diseases requires strong emphasis on improved potable water supplies, human waste disposal, and personal and household hygiene. There is a direct relationship between the health practices of rural villagers and the amount of water available for their use.

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*The Physical Quality of Life Index (PQLI) was developed by the Overseas Development Council as a non-income measurement that summarizes many aspects of well-being. The PQLI is calculated by averaging indexes on a scale of 0 (the most unfavorable performance in 1950) to 100 (the best performance expected by the end of the century) for infant mortality, life expectancy, and literacy into a single composite index.

The Ministry of Health (MOH) has initiated new programs emphasizing the health education component of water supply programs. (International Water Supply and Sanitation Decade Country Report, 1980, p.2.)

- With WHO and various NGOs, the Ministry has started a primary health care project in the Northern Province.
- The Ministry is establishing village health development committees which identify public health problems in villages and implement schemes to alleviate the problems. By involving the village in the problem identification phase, the Ministry is creating a sense of ownership for development projects among those most directly concerned.
- The government plans to provide a system of neighborhood sanitation centers for the urban poor. The Ministry of Energy and Power (MEP) has responsibility for the construction of the system, while MOH will have responsibility for the operation of the system.

Implementing Agencies

The following ministries are listed in the Report (p. 1) as having responsibility in Water Resource Development and Sanitation.

- The Ministry of Energy and Power (MEP), through its Water Supply Division, has the major responsibility for water resource development as well as water quality and sanitation monitoring throughout the country, with the exception of the greater Freetown Area, which is serviced by the Guma Valley Water Company. MEP also has responsibility for urban sanitation.
- The Ministry of Agriculture and Forestry (MAF), formerly the Ministry of Agriculture and Natural Resources (MANR), is also actively involved in village water supply programs through its Integrated Agricultural Development Projects (IADP). The IADPs view the development of water resources as a necessary component of integrated development. Currently, three IADPs are engaged in constructing wells, while two others will begin this year. Funding for the well projects comes from UNICEF, UNDP, the EEC, the Federal Republic of Germany, and the World Bank.
- The Ministry of Health (MOH) is responsible for the monitoring of water quality and rural sanitation. MOH has been involved in several latrine and shallow well projects. The Primary Health Care (PHC) project in the Northern Province includes wells and latrines in its primary health care strategy. Additionally, MOH has expanded its environmental sanitation efforts in the Bo District to include the construction of wells and latrines. It is also establishing village health education committees to identify health needs and to develop plans to meet those needs.
- The Ministry of Social Welfare and Rural Development also has Community Development programs which involve the construction of hand-dug shallow wells.

Interministerial National Action Committee

The "National Water and Sanitation Decade Committee" consists of representatives from the MEP, MOH, MAF, the Ministries of Social Welfare and Rural Development, Development and Economic Planning, and Education, WHO, UNDP, Freetown City Council, and the Peace Corps. This committee has been meeting on a regular basis since 1979 to collaborate on the development of plans designed to meet the goals of the Decade and to respond to requests for information from the UN and the World Bank. The National Committee also identifies and recommends projects to bilateral and multilateral funding agencies in line with government programs. The policies agreed upon by the National Committee are reflected in the budget requests submitted by MEP. (International Water Supply and Sanitation Decade Country Report, 1980, p.2.)

According to the Report (p. 3), the major constraints to meeting water supply and sanitation needs include lack of funds, lack of trained professional and para-professional manpower, and lack of equipment to do testing of underground water sources, which is considered the safest and cheapest source. Recurrent funding allocations are far below what is needed for the operation and maintenance of water-supply and sanitation development projects. For this reason, the National Committee is emphasizing low-cost technology and hand-dug wells which are relatively maintenance-free, except for periodic replacement of rope buckets and pulleys.

OVERVIEW OF CASE STUDY PROJECTS INVOLVING WATER/SANITATION*

Name	Year(s)	Goals/Activities	Size**
Rural Community Development Project	1962-65	PCVs worked in rural community construction, fisheries development, cooperative education, and medicine. In 1964, the fisheries and cooperative education aspects were eliminated and the project focused on rural construction using local materials and labor.	Medium
Chiefdom Development Project	1966-72	Volunteers worked with the Department of Agriculture to introduce techniques to increase crop yields, including better water control and irrigation systems and agricultural/nutrition extension.	Large
Agricultural Extension Project (in 1979 became Small Farmers Project)	1971-present	PCVs worked in agricultural extension with emphasis on irrigation systems and water control for rice production.	Large
Rural Water Supply Project	1972-73	Through the Ministry of Works, PCVs provided design, logistical, and technical support, and supervision, to a program to establish clean, year-round piped water to rural towns. Included training of counterparts.	Large
Provincial Village Water Supply Project	1976-78	PCV engineers designed water systems for villages, trained and supervised counterparts and local labor.	Small
Northern Integrated Agricultural Development Project (NIADP)--Makeni	1977-80	This project included well construction and instruction of communities in water and sanitation issues. PCVs worked in well design and materials development, and acted as community extension workers.	Small

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*This information is taken from Phase I, the Survey of Peace Corps Water and Sanitation Activities from 1970 through 1982.

**Project size is indicated as follows: "Small" represents under five Volunteers; "Medium," 6-12; "Large," 13 or more. Number of Volunteers varied from year to year, therefore this label indicates an average.

Eastern Region IADP--Kenema	1974-present	PCVs dug wells in villages under 1,000 population and constructed piped water systems in villages of 3,000 or more.	Small
Rural Health Development Project	1978-present	Project goals were to teach nutrition, hygiene, and disease prevention; assist in immunization programs; train paramedical personnel; improve sanitation practices and facilities, as well as potable water supplies.	Large
Small Farmers Project	1979-present	Continuation of Agricultural Extension Project	Large
MEP/RWSU--IADP--PC Projects	1980-present	This program emphasizes supply of water through hand-dug wells to villages; establishment of health committees responsible for local participation in well construction, use, and maintenance; environmental health.	Medium

TIMELINE OF SIGNIFICANT EVENTS COVERED IN THE SIERRA LEONE CASE STUDY

Rural Community Development (RCD) Project begins	1962	
(emphasis construction)	1964	
RCD Project evolves into Chiefdom Development Project (CDP) Rural Development Coordinating Committees set up	1966	
CDP provides potable water to villages and schools--deep and shallow well handpumps	1970	Rural Water Supply (RWS) Program beginnings in Ministry of Works
Agricultural Extension Project begins	1971	
	1972	RWS Project recruits PCV engineers. Piped water systems in medium sized towns and villages.
	1973	Ministry of Energy and Power established
Agricultural Extensionists provide irrigation and drainage techniques to rice farmers	1974	Eastern Region IADP begins
	1976	Provincial Village Water Supply Project under the MEP
Rural Water Supply Survey	1977	IADPs begin including water projects
Large Agricultural Extension Project developing inland valley swamps	1978	IADPs begin Health Education component
Begin Rural Health Development Project		
Small Farmers Project begins with Community Swamp Development subproject	1979	National Committee for Water and Sanitation Decade established

UNITED NATIONS WATER SUPPLY AND SANITATION DECADE BEGINS	1980	Rural Water Supply Unit established in MEP/WSD IADP/PC/MEP hand-dug wells in small villages PCV shift from engineers to generalists

HISTORY OF PEACE CORPS WATER/SANITATION ACTIVITIES

Since entering Sierra Leone in 1961, Peace Corps has developed one of the agency's most successful integrated approaches to development with large extension programs in agriculture, water, and health education. The programs today grew directly from the first rural development program in 1962. Volunteers recruited in the 1960s were generalists; in the 1970s many water Volunteers were engineers; but in the 1980s recruitment has returned to generalists.

Peace Corps played a significant role in preparing Sierra Leone for the United Nations International Water Supply and Sanitation Decade, from conducting the 1976 Rural Water Supply Survey to being represented on the National Committee for the Decade.

Other significant factors in the development of water supply and sanitation in Sierra Leone were the active involvement of the UNDP and the establishment of Ministry divisions to specifically address rural water supply, health education, and environmental sanitation.

RURAL COMMUNITY DEVELOPMENT

Rural Community Development Project (RCD) (1962-65)

Collaborating agencies:* Peace Corps, Ministry of Development, USAID

The first group of 29 Volunteers in this project consisted of four PCVs in cooperative education, three in fisheries development, twelve in construction, and ten (doctors and nurses) in medicine. To replace and expand the nonmedical RCD Volunteers, the Government of Sierra Leone requested for 1964 an additional 42 to 50 PCVs to concentrate on a nationwide rural community construction program. The cooperative education and fisheries activities were not continued. (Wiggins Memorandum, 1963.)

In 1963, the Minister of Development proposed assigning two to four of these Volunteers to each of the 13 districts of Sierra Leone, plus one Volunteer team to each of the three provincial capitals. The Ministry planned to use these Volunteers to establish a rural development nucleus through which the Public Works authorities could administer a coordinated rural development program on the district level.

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*Agencies may collaborate on projects in a number of ways: funding, such as by the World Bank, EEC, USAID; in a cooperative effort such as with CARE, CRS, CUSO; or as part of a signed agreement such as with TransCentury Foundation or a Ministry of Health.

Peace Corps was asked to concentrate on rural community construction programs because their construction teams, working in three of the five districts of the Northern Province, had been successful. As pioneers in the field of self-help community development in Africa, these PCVs gained the confidence of local governments, chiefs, and villagers in the concept of using voluntary labor and locally available materials to complement provincial RCD budgets and USAID assistance for rural development projects.

In the villages, the PCVs supplied technical guidance and skilled labor to projects involving the construction of simple feeder roads, village water supplies, and school or other small-building construction. The work involved such things as installing simple, prefab culverts of concrete bridges; basic trace surveys for roads; water systems consisting of simple wells or piped water through gravity-flow from nearby streams or dams; use of a cinva-ram block-making machine; laying foundations; and basic carpentry.

Construction workers assisted the local authorities--District Officer, district public works engineer, and village chiefs--by providing estimates of material needed and time required for completion of the individual projects they wished to undertake with funds they had available for community development.

As word spread of accomplishments, Districts throughout the country requested similar teams. One provincial officer noted that Peace Corps teams worked successfully in remote areas where independent contractors would not even bid for jobs.

USAID's primary function in Sierra Leone at that time was rural development; therefore, they contributed tools and materials directly to the villages and grants to the District Councils. In 1963, USAID also contributed $75,000 for commodity support to the Peace Corps RCD program.

Chiefdom Development Project (CD) (1966-72)

Collaborating agencies: Peace Corps; Department of Agriculture; Department of Social Welfare, Health, and Works; the Cooperative Department; USAID; UNESCO; District Councils; WHO; FAO; CARE

In 1965, the Government of Sierra Leone (GOSL) requested that the RCD project be expanded to become an agriculturally-based community development project at the chiefdom level. One GOSL goal was to increase production of food crops to improve nutrition and reduce imports. A second goal was to increase production of export crops, such as palm products, coffee, cocoa, cola nuts, and ginger.

A serious shortage of agricultural extensionists had hindered the increase of agricultural production. The chiefdom development program was intended to alleviate this shortage. The Volunteers were to live and work full time in a single chiefdom rather than an entire district; thus, the project was called the Chiefdom Development Project. It was administered by Peace Corps with the professional support of CARE. (Wiggins Memorandum, 1965.)

Challenges for the project were: (a) to introduce simple techniques to increase crop yield and income (for instance, better water control could increase rice productivity by 90 percent); (b) to reorganize land use, e.g., to organize cooperatives to develop plantation systems; (c) to transfer from a subsistence economy to a cash crop economy (any surplus of foodstuffs would be sold in local or central markets, bringing the family into the money economy, perhaps for the first time). These challenges, whether in technique, land organization, or marketing, were socially based. The ability of Volunteers to become involved with the people, become accepted by them, and gain their confidence was of equal importance to their technical skills. (Wiggins Memorandum, 1965.)

Volunteers worked with the Agricultural Officer, the district-level agent of the Department of Agriculture. Volunteers continued with their former construction activities, supplementing them with activities in health education, literacy, and nutrition education. Twenty-one of the group of 95 recruited for this project were female, working primarily with domestic and social development of women and children.

This program was not tied formally to any other sources of assistance, but Volunteers could get assistance from USAID, the District Council Self-Help Program, UNESCO, WHO, and FAO.

Because various departments were involved in particular aspects of development activity in this program area--the Cooperative Department, the Department of Agriculture, and the Department of Social Welfare, Health, and Works--there was a need for coordination of efforts. An overall Development Coordination Committee and committees at both the provincial and the district level were formed.

In 1966, the GOSL requested Peace Corps to provide 100 Volunteers, a net increase of 40, to continue the Chiefdom Development Project. More public health, sanitation, and nutrition programs were added, and the newly created Rural Development Coordinating Committees were strengthened. Volunteers served on these committees, assisting in the formation of one- and five-year plans, establishing priorities for projects, and generally assisting the Chiefdom in economic development. (Quimby Memorandum, 1966.)

These Volunteers were, for the most part, B.A. generalists, with ability to supervise construction (chieftains supplied communal labor) on a part-time or short-term basis. They were not formally trained; they relied on technical support from the Volunteer Coordinator.

To fund the project, the government allocated the following funds from its 1966-67 budget of \$32.9 million: \$4.7 million to provincial water supplies; \$6.9 million to roads and bridges; \$1.5 million to provincial schools; and \$.3 million to provincial hospitals and clinics.

PC/SL envisioned the continued expansion of this project from 100 Volunteers in 1967 to 150 PCVs by 1971.

The Rural Community Development and Chiefdom Development projects laid the groundwork for projects focusing on water supply. The RCD and CD Volunteers worked on water supplies, chiefly in gravity-fed and hydraulic ram installation, and most of what they installed was still working satisfactorily and being maintained by villagers in 1972 when the Rural Water Supply Project was begun. (Public Works, Rural Water Supply Project Description, 1971.)

Rural Water Supply Project (1972-73)

Collaborating agencies: Peace Corps, Ministry of Works, Ministry of Social Welfare, Ministry of Development, Ministry of the Interior, U.S. Embassy, Catholic Relief Services (CRS), Canadian University Service Overseas (CUSO), and CARE

A 1970 survey of Sierra Leone revealed more than 130 "towns" with populations of between 1,000 and 3,000 that had no existing water supplies other than unreliable local streams or swamps. There were, in addition, more than 325 "villages" with between 500 and 1,000 people which did not have any regular, safe supply of water. Up to that point, GOSL efforts in developing water systems had been primarily in the larger cities. (Public Works, Rural Water Supply Project Description, 1971.)

In 1970, an agricultural Volunteer who was a qualified water systems engineer transferred from the agricultural program to work as a technical advisor to education Volunteers who were interested in working on water supply projects as a secondary activity. He was assigned to the Ministry of Works (MOW) to perform his duties in close association with CARE.

When USAID left Sierra Leone after political upheavals in 1967, it left with CARE plans and 5,000 feet of pipe for village water supply systems. CARE lacked the personnel and funds to coordinate and administer a large water supply program. Pulling together all the available materials and previously prepared plans, the MOW Volunteer started designing new systems. According to the 1971 Project Description, he obtained monies and supplies from the U.S. Embassy, CARE, MOW, and Catholic Relief Services. Through the efforts of this water supply engineer and other Volunteers, over 20 water supply systems were constructed, and 50 handpumps installed during 1970 and 1971. (Water Survey, 1977, p. 9.)

By the end of 1971, the Volunteer Coordinator had completed service and left Sierra Leone, and most of the USAID-CARE provided pipe and materials had been installed. Yet with the increased demand for rural water systems, it became apparent that the spare-time, off-season, informal approach was inadequate. The Ministry of Works requested the full-time assistance of a team of specially trained Volunteers. Building on Peace Corps' recent experience, Volunteers helped with the development of the project plan for a new Rural Water Supply Project.

The objectives of the Rural Water Supply Project were: to establish an on-going program of providing clean, year-round piped water to rural towns in Sierra Leone; to survey and design town water systems throughout the country; to provide organizational and technical support in the implementation of some systems; and to train Sierra Leoneans to design, implement, and maintain these water systems when the Volunteers left.

The Peace Corps approach would remain the same as in earlier projects, with emphasis on self-help, chieftain-provided communal labor, materials paid for partly by the town, partly by government agencies, and use of temporary personnel for project supervision. The water supply teams were to provide design, logistical, and technical support, and occasionally direct supervision for projects. (Project Description, 1971.)

Eight Volunteers were trained for the Rural Water Supply Project under the direction of the Volunteer Team Leader, with assistance from MOW staff incountry. The Team Leader was an experienced and fully qualified water engineer. Volunteers were given technical on-the-job training in design and construction of a water system, an orientation to the Ministry's operations, procedures required to mobilize materials to build the systems, language training, and cross-cultural orientation. Training lasted twelve weeks with nine Sierra Leonean draftsmen/water system trainees in full participation.

A major part of the Rural Water Supply Project was the training of counterparts. However, of the nine counterparts in the training program, only one was a qualified design engineer capable of surveying. The lack of proficiency in basic mathematics hindered the progress of others in the more complicated tasks of design work.

The project was dependent on the availability of at least one experienced and fully qualified water systems engineer. This engineer had to arrive early to develop the training program. Trainees were single, male civil engineers. Water systems engineers were preferred, but backgrounds in other types of engineering or hydrology--or if less than a B.S., related experience (plumbers, draftsmen)--were acceptable.

There was much interest on the part of the GOSL, through the MOW, in bringing water systems to the middle-sized towns, although resources for this activity were still limited. The 1972-73 proposed MOW budget request included, for the first time, some funds to pay for the installation of rural water systems. Recent experience had shown that, if careful use were made of communal labor, of the supervisory and technical skills of the Volunteers, and of the water works supplies paid for by contributions from the town, MOW, the Ministry of Development, Ministry of Interior, the U.S. Embassy, CARE, and other domestic and international agencies, then good, permanent, simple water systems could be installed with only modest cash outlay. (Water Supply Program, 1971 Annual Report.)

The GOSL Water Supply Program was divided into three phases: Phase I covered six towns in the Koinadugu District; Phase II covered 20 towns, schools, and hospitals all over Sierra Leone; and Phase III covered 65 towns all over Sierra Leone. The Phase III list of towns and villages was approved by the Sierra Leone government cabinet in July 1972.

The Rural Water Supply Volunteers were posted to complete Phase I and II systems and begin work in the five towns/villages given first priority under Phase III. Designs were to be completed and materials assembled so that construction could begin in early 1973 for Phase III projects.

In 1972, construction work was completed and systems opened in six locations under Phase II. Final surveys and designs were completed for 15 Phase

III systems and the preliminary surveys and reports completed for another 25 towns. In addition to work on the village systems, a total of 65 deep-well handpumps were installed in various villages during the year. It was estimated that by 1972, at least 55,000 persons in about 100 villages were being provided water by Peace Corps-sponsored village piped-water systems and wells.

Accomplishments in 1973 were: eight large water systems designed and constructed in provincial towns, 40 small deep-well pumps installed in villages, plans and designs for installation of six other water systems completed, and over 200 Sierra Leoneans trained in water systems construction and maintenance techniques. (Rural Water Supply, Annual Report, 1973.)

This project received the cooperation of the Ministry of Works, the Ministry of Social Welfare, the Area Engineers in the various provinces, and the Chiefs and people of the Chiefdoms. Equipment and funds were partially provided by the U.S. Embassy and CARE. Between 1969 and 1974, 325 Dempster handpumps were brought into Sierra Leone through the U.S. Embassy Self-Help Fund. A number of others were provided by the Catholic Relief Services (CRS), Canadian University Service Overseas (CUSO), and the Eastern Mobai Clinic. The U.S. Embassy provided an additional 100 pumps in mid-1972 and these were distributed for installation on a "self-help" basis.

Because the Peace Corps agricultural program was concentrated in the Southern and Eastern Provinces, nearly all the pumps of the deep-well pump projects were installed there. A 1973 change in Ministry of Agriculture policy shifted these activities to the Northern Province.

In late 1973, the Volunteer engineers completed their tours and were not replaced. In 1974, the Ministry of Works requested five additional water supply Volunteers. However, when three PCVs arrived in response to this request, they were instead assigned to work on the national feeder roads project administered by CARE under MOW. (Survey, 1977, p. 9.)

The Ministry of Energy and Power

The Ministry of Energy and Power (MEP) was established in 1974 to take over all water supply development from the MOW. The MEP was responsible for providing water supply systems and sewage disposal systems throughout the country (excepting Freetown, which remained under the Guma Valley Water Authority).

Integrated Agricultural Development Projects

At the same time, the GOSL shifted its attention from piped water systems in larger provincial towns to projects in smaller villages, moving from isolated sectoral efforts toward integrated rural development. The bases of these efforts were the regional Integrated Agricultural Development Projects (IADPs), which were funded by various sources including the World Bank, EEC, and the Federal Republic of Germany. The IADPs combined agricultural improvement with other rural development activities including improvement of village water sources. The IADPs served as implementing agencies for the national rural water supply program carried out by MEP.* (Rural Water Supply Project Description, 1982.) Peace Corps Volunteers were assigned to a number of these IADPs.

Eastern Region-Kenema IADP (1974-present)

Collaborating agencies: Peace Corps, World Bank, Ministry of Agriculture and Forestry, Ministry of Energy and Power, Ministry of Natural Resources, U.S. Embassy Self-Help Fund, Canadian University Service Overseas (CUSO).

Begun in 1974, the Eastern Region-Kenema IADP, under the auspices of the Ministry of Agriculture and Forestry in cooperation with MEP, constructed ten wells in ten villages, and had another 25 wells under construction in villages of fewer than 1,000 population. PCV engineers and site supervisors began work on three piped water systems in villages of approximately 3,000 people each. (CMP FY1980.)

In 1979, the IADP Village Wells Project began, sponsored by the World Bank in conjunction with the Ministry of Agriculture and Forestry and the Ministry of Natural Resources. The project area covered ten chiefdoms--1,500 square miles--with a total population of 232,000 within the IADP area. This project was specifically designed for people living in villages under 1,000 population, making the target population 180,000. The water supply goals for 1979 were construction of 200 hand-dug wells (bucket, steel pulley, and lockable cover) to serve 30,000 people at a ratio of one well/150 persons. The villagers were to contribute all the unskilled labor, sand and stone, meals and lodging for project staff. Village input covered approximately 20 percent of total cost. This project's simple bucket-pulley well design, initiated by two PCVs, was adopted as the national standard by joint agreement of the MEP and the MOH. The well design called for complete lining from top to bottom using a combination of cast-in-situ concrete, ferrocement plastering, and pre-cast concrete culvert pipe. (IADP Wells Progress Report, 1979.)

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*The GOSL attracted external funding for agricultural development by setting up Integrated Agricultural Development Projects (IADPs) throughout Sierra Leone. Bilateral and multilateral funders were not willing to put money directly into the Ministry of Agriculture and Forestry (MAF) to support its own extension efforts so GOSL divided Sierre Leone into IADPs. The first such project was funded by the International Development Authority (IDA) in the Eastern Region. The Eastern Area Project was followed by another IADP in the North--Makeni. Other IADPs were started in the far north (the Koinadugu IADP funded by the EEC) and in the center of the country (the Magbosi IADP) followed by one in the Northwest and two in the South. The goals of these projects are to promote agricultural development by integrating agricultural needs with other rural development needs, such as feeder road construction and the digging of village wells. All the projects have loan schemes attached to them to provide poor farmers with the capital needed to purchase agricultural inputs (seeds, fertilizer, insecticides, tools) and to hire labor to develop farm lands such as inland valley swamps, mangrove swamps, and permanently cultivated uplands. Some of the projects have marketing components for cash crops. Almost all of the projects are trying to improve rice production. The projects are also creating improved infrastructures by building offices, stores, garages, etc., and purchasing vehicles and tools which will eventually be turned over to MAF. The main work of the projects, however, is to provide agricultural extension to farmers. Extension agents are hired by the projects (often from existing MAF personnel), given further training and closer supervision, supplied with motorized transport and bicycles, and posted out in the countryside to work with farmers.

The project was managed by PCVs until 1983 when a Sierra Leonean engineer took over. Counterparts often worked under PCVs rather than on an equal basis. Unskilled laborers developed construction skills. Water supply program technicians developed construction and project organization skills through training and on-the-job experience. Women and children benefited from provision of convenient water supplies. (Questionnaires.)

Accomplishments for 1982 included 17 staff members trained, 15 wells completed and ten more near completion, and water-related health education programs initiated in villages constructing wells.

This project and those like it using self-help in community development boosted morale and encouraged further projects by its success. The project staff's understanding of the culture and local language ability were as important as the technical skills needed. (Questionnaires.)

MEP's Rural Water Supply Program

In 1976 the MEP's Water Supply Division (WSD) started the Rural Water Supply Program focusing on smaller villages in rural areas. The program's goal was to design and construct 25 rural village water systems by 1982; these systems would benefit a targeted population of 50,000 people. The program was supported by the EEC, UNICEF, Catholic Relief Services (CRS), USAID, Canadian University Service Overseas (CUSO), and U.S. Embassy Self-Help Fund. The first objectives of the Water Supply Division were to survey all existing rural village water systems, pumps, and wells, and to submit a report to the MEP and the National Rural Village Water Supply Committee. (Program Description 1976.)

Rural Water Supply Survey. The survey was carried out for two basic purposes: (a) data were needed to acquire outside funding; and (2) validation of the needs for rural water supplies was useful in convincing MEP engineers to shift the focus from urban to rural water systems. The survey laid the groundwork for the establishment of the Rural Water Supply Unit in the MEP/WSD. (See page 123.)

The survey was conducted by five Peace Corps Volunteers during the 1977 wet season when the self-help labor for their primary projects was not available. Each PCV spent one month on the survey. PC/IST monies were used to support the survey expenses. (See Appendices E.1 and E.2 for the survey report and the survey form.) (Rural Water Supply Survey, 1977.)

Provincial Village Water Supply Project (1976-78)

Collaborating agencies: Peace Corps, Ministry of Energy and Power (MEP), EEC, UNICEF, Catholic Relief Services (CRS), USAID, Canadian University Service Overseas (CUSO), U.S. Embassy Self-Help Fund

In 1976, MEP requested six Peace Corps engineers to work in the Ministry's Provincial Village Water Supply Project. Peace Corps could only recruit two new Volunteers from the United States, so four Volunteers who were presently incountry working in other programs were transferred to the water supply program. Of the six Volunteers entering the program, four were engineers. Volunteer responsibilities were to design and secure approval for a water system for a village, help procure third party donor support, and train and supervise a counterpart and local work force to construct the water system. The PCVs were to report to the Chief Engineer of the MEP. (Program Handing Over Notes, 1977.)

Following a six-week training program, five of the PCVs were posted to rural villages, and one Volunteer remained in Freetown to serve as the program coordinator. Each Volunteer was provided with a motorcycle and petrol by the MEP, and one MEP technician-in-training was assigned to each PCV as a counterpart. (Water Survey, 1977, p. 10.)

In 1978, PC/Sierra Leone complained to the government about lack of agreed funding for the water projects. Though the funds were budgeted, there was difficulty getting them allocated to the projects or getting materials supplied. As a result, one Volunteer terminated and two PCVs were forced to delay projects three to four months because the funds/supplies were not available. Peace Corps stated they would request no further Volunteers for the program until the situation was corrected. (Hafner Memorandum, June 1978.)

Northern IADP-Makeni (1977-80)

Collaborating agencies: Peace Corps, Ministry of Agriculture and Forestry, World Bank, CARE, Plan International

In 1977, one Volunteer assisted the Northern IADP-Makeni (NIADP) in standardizing the model for the construction of 200 wells with an original $50,000 budget. He set up the wells office and modified a design used by Peace Corps/Upper Volta, incorporating features from the model used in the Eastern Region-Kenema IADP. This Volunteer wrote proposals to donor agencies and received funds for wells construction from CARE and Plan International. (Hafner Interview, 1983.)

In 1978, a meeting was held at the Water Supply Division of MEP to discuss health education materials for the IADP wells projects. In attendance were representatives from CARE, the NIADP, the Water Supply Division of MEP, WHO, MOH, the Christian Health Association of Sierra Leone, and Peace Corps. Goals of the health education component were to teach villagers (primarily nonliterate people) about water quality, water use, well maintenance, and topics related to general sanitation. It was recommended that villagers make a formal commitment to participate in the maintenance and supervision of the well use.

Health education was aimed at all segments of the village community. The lessons were to be presented by extension workers who were already active in these communities. This project was sponsored by the Northern Area IADP at Makeni, with support from Plan International and CARE. Plan International was in charge of conducting surveys, CARE was responsible for producing health education materials, and a PCV served as graphics advisor. (Minutes of Meeting, March 1978.)

The schedule for integrating the health education component was as follows. In 1978, villages would be surveyed and educational materials would be drafted and field-tested. In 1979, surveying would continue, materials would be printed, and extension workers would be trained in use of the materials. Then the lessons would be taught, followed by surveys and evaluations. In 1980, there would be follow-up lessons, more surveys and evaluations, the final revisions, and final project evaluation. There were, in fact, delays in this schedule. (IADP Progress Report, 1979.)

PCV Recruitment and Training. Volunteers recruited for the water supply projects in 1978 were males with B.S. degrees in Engineering, preferably Civil Engineering, or with some college and several years of practical experience. Only single male Volunteers were recruited at this time due to the mobility of the job, the heavy physical exertion involved, and the fact that, in traditional Sierra Leonean society, women would be considered unacceptable for this type of assignment. (TAC, 1978.)

Eight Volunteers were recruited for 1979, four wells engineers and four civil engineers. Training increased from six to eight weeks for 1979 Trainees and included a technical component: surveying and mapping, ground water hydrology, construction methods, and community development techniques. (See Appendix E.4 for a description of Sierra Leone's Village Based Training Scheme.)

Sierra Leone and the International Water Supply and Sanitation Decade. Peace Corps officially became involved in the UN International Water Supply and Sanitation Decade in April 1979, when representatives participated in the Ad Hoc Committee which evolved into the National Committee for the Water and Sanitation Decade. The Committee was chaired by the WHO program coordinator. Other representatives on the Committee were from the Ministries of Energy and Power, Health, Education, Development, and Agriculture, as well as the UNDP. Peace Corps wrote the first draft of the proposal for a water/sanitation manpower training program in Sierra Leone, as well as the Country Report for Sierra Leone. (CMP FY1981.)

The strategy behind the manpower training proposal was that with adequate numbers of manpower trained in the water and sanitation sectors, Sierra Leone would be prepared to efficiently utilize "Decade" funds when they became available.

During a Seminar on Environmental Education and Rural Water Supply in 1981, the water supply situation in Sierra Leone was discussed by representatives from MEP/WSD, CARE, UNDP, PC, the IADPs, WHO, and UNICEF. It was pointed out that the Ministry of Energy and Power was a relatively new Ministry with almost nonexistent infrastructure and critical financial constraints. To date, urban water supply had been given priority, primarily in the form of pipe-borne, treated water systems constructed by contract and funded largely by external assistance. (Technical Aspects--Rural Water Supply Meeting, 1981, p. 11.)

The MEP's Rural Water Supply Program had limited external assistance which was neither comprehensive nor systematic in approach. Peace Corps had, with the assistance of various donors, constructed a number of gravity-fed systems. CRS, CARE, various Ministries, and others had attempted limited activities. The water component of the Makeni IADP was the first large-scale attempt at rural water supply. Unfortunately, coordination and cooperation between the project and the Ministry was limited, and the results of this scheme seem to have been mixed. It was a beginning, and it started a movement towards developing water supply in the rural sector. However, more comprehensive planning and coordination were necessary to improve results.

In view of this need, the MEP, through the National Committee for the Water and Sanitation Decade, requested UN assistance in the area of rural water supply. UNDP agreed to fund a field project in conjunction with the Kenema IADP (KIADP) and to assist in establishing a Rural Water Supply Unit within MEP's Water Supply Division. This unit would be responsible for planning and coordinating all rural water supply activities throughout the country. The UNDP provided two staff members (former PCVs) for the new unit.

The Ministry called on all donors to join together in this effort. The objective was to develop a comprehensive program with an integrated approach. The program was to be preceded by environmental education and followed by maintenance; it was to include a water quality analysis program. This was an ambitious and costly project, and required a great deal of interministerial cooperation to utilize the limited resources available.

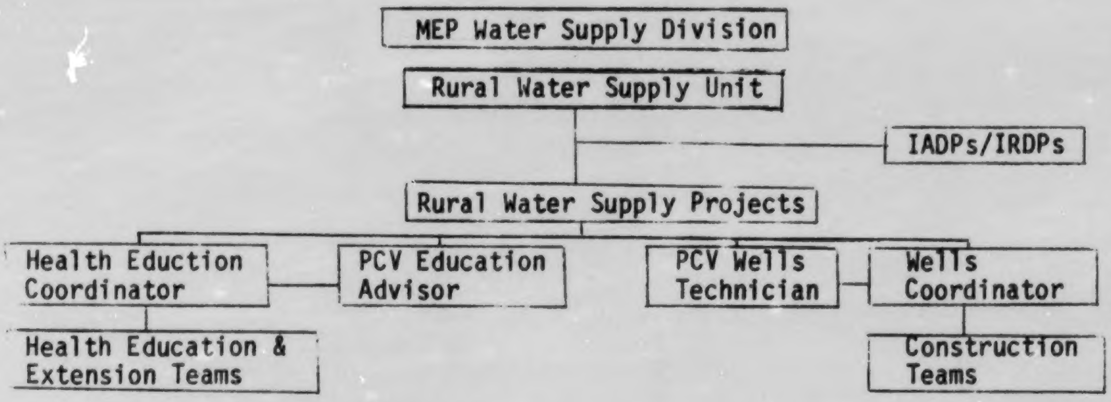
The Water Supply Division was to be involved in the planning of all rural water activities. The Rural Water Supply Unit (RWSU), set up in 1980, would coordinate the various projects and, where possible, provide key technical personnel to assure implementation.

Rural Water Supply Unit (RWSU)/MEP--IADP--PC Projects (1980-present)

Collaborating agencies: Peace Corps, UNICEF, UNDP

A new program was devised in 1980 by the RWSU in collaboration with the IADPs of seven provinces and Peace Corps. The emphasis in water supply shifted from construction of piped-water systems in medium-sized towns and villages to hand-dug wells in smaller villages. This signaled a shift in PCV recruitment for water-supply technicians from engineers to generalists, including women, who would be skill-trained. (CMP FY1981.) Peace Corps also provided health education advisors, the first of which were non-matrixed spouses of water supply technicians. (The team work of the couples was so effective that PC/SL now recruits for couples only.)

While the RWSU was responsible for the design, supervision, and evaluation of national rural water supply efforts, the IADPs served as the implementing arm for rural water supply construction. The IADPs provided staff, vehicles and maintenance, gasoline, and construction materials. The following chart illustrates the relationships of the participating parties. (Rural Water Supply Project Plan, 1982.)


MEP Water Supply Division
Rural Water Supply Unit
IADPs/IRDPs
Rural Water Supply Projects
Health Eduction Coordinator
PCV Education Advisor
PCV Wells Technician
Wells Coordinator
Health Education & Extension Teams
Construction Teams

The project's objectives were to provide safe drinking water by the year 1990 for communities of from 100 to 2,000 inhabitants and to train an environmental health committee in each village. The committee would organize village participation in well construction and instruct and supervise villagers' use and maintenance of the well.

In 1981, the National Committee for the Water and Sanitation Decade approached the government for assistance in developing a system for helping village people understand the essence of clean water and sanitation. The Committee recognized the importance of implementing such a system, particularly as numerous construction projects were about to begin. The GOSL requested and was provided with a UNICEF consultant who proposed the establishment of a National Secretariat and program in the area of environmental education. (Notes from Environmental Education/ Rural Water Supply Seminar, 1981.)

A limited pilot scheme was proposed for the four areas where rural water supply projects were being implemented. Environmental Education Coordinators and Assistants were to be selected, and workshops, followup visits, and visual aids organized. UNICEF agreed to finance the Committee's pilot proposal. (See Appendix E.3 for guidelines issued for the Environmental Health Education component of the National Rural Water Supply Projects.)

In July, the Water Supply Division of MEP took responsibility for the pilot scheme. District Environmental Coordinators and their programs were brought under the umbrella of the water projects, becoming responsible to the project Water Coordinator. When the province hosting the pilot scheme pointed out that there were no budgeted funds for environmental sanitation activities, the UNDP Representative offered the opinion that either funds should be obtained for these activities or the number of wells should be decreased to allow the education aspect to function.

Water Coordinators reported that when well-digging progress was slow due to financial restraints and late arrival of equipment, the delays had their positive side in that sanitation education then took place along with the construction of pit latrines and compost pits.

A survey of accomplishments from March to November 1981 revealed health education activities including 18 workshops, numerous surveys, and follow-up visits. One area had difficulties when the Health Education Coordinator and the Water Coordinator had different understandings of their roles and authority, which led to the Health Education Coordinator being replaced.

In 1981, there were five PCV well technicians and three environmental education Volunteers in this project; in 1982, there were four Volunteer water-supply technicians and three health education advisors. (Morrow Cable, December 1982.)

As of this writing, it can be reported that 40 to 60 wells are constructed annually per IADP project area with as many health committees formed and functioning. Though the environmental sanitation education component was not part of the original program design, it has received increasing emphasis by all parties and has become the critical factor in water supply maintenance after construction. (CMP FY1983.)

Since 1981, a few of the projects have been experimenting with assisting participating villages in latrine construction by providing latrine slabs once a hole has been dug. According to APCD Morrow (May 1983), these efforts have met with limited success as the latrine component is not a priority issue. The MEP is initiating pilots of various latrine designs (primarily the ventilated improved pit (VIP) privy) in an effort to establish national standards for latrine construction and maintenance. This work at the local level is coordinated by the health education teams of each unit.

Piloting of handpumps is also a new development within the program. UNICEF has donated 25 India Mark II handpumps. The biggest problem with these pumps, says Morrow, is that the villagers will be able to perform only limited maintenance, and at present do not have an adequate maintenance program designed nor the ability to carry one out. Until this can be resolved, pump installation is being restricted.

A long-term goal for the program is to install handpumps on all wells. Partly for this reason, MEP is requesting that all wells be dug to a standard design. Standardization will allow handpumps to be installed nationally at a later date when the maintenance program is operational.

Standardization is a critical issue within the program. The MEP hopes to standardize well design, latrine construction components, maintenance schedules, and the water quality program for all ongoing water and sanitation activities in the country. (These include missionary efforts, secondary activities of PCVs, etc.) In addition, MEP would like to set up a mobile team which could assist individual efforts in water and sanitation by providing technical advice and consultation. (Morrow, May 1983.)

Morrow adds that the MEP is also considering lending molds, ropes, buckets, etc., to assist villagers in building their own wells to MEP design. The villagers could dig as deeply as possible and then when the local RWSU is working in the area, use more sophisticated equipment to deepen the well.

A new component of the program is that of water quality testing. Testing of all wells in all project areas has begun, and UNICEF will fund three mobile water testing units in 1984. UNDP may provide an additional two units.

Volunteer recruitment criteria for 1983 for water supply technicians included three months' experience in community/school related social service activities and an expressed interest in construction, maintenance, and community promotion of potable water on a village level. Criteria also included either two years' full-time experience in general construction, masonry, carpentry, or plumbing or a B.A./B.S. degree in any discipline with three months' experience in general construction, masonry, carpentry, or plumbing. Health Education Advisors were to have: (a) a BA/BS in Social Work, Social Services, or Community Development, (b) a B.A./B.S. degree in any discipline with a demonstrated interest in community organization or community service, (c) two years' full-time experience in community or social service organizations, or (d) VISTA volunteer experience. (TAC, 1983.) PC/Sierra Leone has been more than satisfied with Volunteers recruited with these qualifications, noting that their chief strengths are in their enthusiasm, fresh outlook, willingness to confront difficulties, and organizational skills. (CMP FY1983.)

HEALTH PROGRAM

Before 1977, Peace Corps did not participate in programming with the Ministry of Health's Public Health Division. In the early 1960s, the PC/SL medical program consisted of doctors and nurses. The Director of Health thereafter did not want Volunteers with less than professional qualifications. (PC/SL Briefing Paper, 1977.)

The Peace Corps health program had been characterized by individual Volunteers doing a variety of useful but uncoordinated tasks, such as instructing state-enrolled rural health assistants, providing inservice training to hospital laboratory technicians, and teaching at the Ministry of Health's School for Hospital Laboratory Technicians. In 1977 there were 10 PCVs in such medical roles as individual placements.

In 1975 and 1976, there was one PC programmer for agriculture and rural development with responsibility for 75 Volunteers. However, in 1977, the addition of a staff member divided these sectors between two programmers. The APCD/RD, then with supervision responsibilities for only 25 Volunteers, had time for new program development. (Hafner Interview, 1983.) [It has been pointed out (Paraguay Case Study) that with more than a 40 to 1 Volunteer/staff ratio, the programmer can maintain existing programs but has little time available to create or develop new programs.]

Peace Corps relations with Ministry of Health (MOH) personnel were good, and in November 1977, preliminary discussions were held with the Chief Medical Officer, WHO, and Peace Corps regarding a public health program. In January

1978 the Liberian Deputy Minister of Health was invited to Sierra Leone and reported results of the successful Peace Corps/Liberia public health program to the Sierra Leone Chief Medical Officer. Following this presentation, PC/SL was given permission to work with the MOH in developing the Rural Health Development Project. Eight months later, Volunteers for this new public health project arrived. (Rural Health Development Project Plan, 1978, p. 3.)

Rural Health Development Project (1978-present)

Collaborating agencies: Peace Corps, Ministry of Health, Catholic Relief Services (CRS), WHO, UNICEF

Although health problems were ranked second in PC/SL programming priority, after food production, as a new program the Rural Health Development Project was given highest priority by PC/SL. Eight skill-trained Volunteers (STVs) arrived in September 1978 for the new project. It was anticipated that this new project would complement the water supply project which was then shifting emphasis from water supply systems to promoting small village wells. (Country Analysis Summary, 1977, p. 3.)

The previous GOSL public health emphasis had been on enforcement of regulations rather than education. Peace Corps' project goals by 1980 were to improve the understanding of good public health practices of 2,000 villagers, improve environmental sanitation conditions in 80 villages in the Southern Province, improve the skills and training of eight Sanitary Overseers, and improve the lines of communication and field supervision of MOH officials working in rural villages. (Project Plan, 1978, p. 4.)

Objectives for 1978-79 included: community health assessments and surveys completed in 80 villages; 50 village sanitation committees established, with each committee having selected its first three environmental sanitation projects and written the appropriate by-laws for them; 50 village sanitation projects completed; in-service training for ten chiefdom Sanitary Overseers provided; on-the-job training provided for School of Hygiene students; 800 home visits made; and 25 wells, 100 latrines, 20 clothes washing areas, 50 garbage pits, and ten school cisterns constructed.

Volunteers were assigned as Public Health Inspector Aides who would assist villagers in establishing village health committees and assist them in meeting the project's objectives.

As part of the project, Peace Corps was also discussing health programming possibilities with the Christian Hospital Association of Sierra Leone, the "umbrella" organization representing all mission medical facilities. By 1979, the project was supported by CRS grants, U.S. Embassy Self-Help Fund, and various mission hospitals.

The MOH actively participated in pre-service training, provided petrol, and supported the project as much as possible even though resources were limited. To monitor the project, Volunteers filled out monthly reports and held monthly meetings with the PC/APCD/Health and the District Health Superintendent. (Project Summary Sheet, CMP FY1978.)

There was to be particular emphasis on the involvement of women. Women in rural villages generally did not fully understand the concepts of personal hygiene, proper nutrition, infant and child care, proper human waste disposal, hygienic market practices, or the dangers in polluted drinking water. No women were Public Health Inspectors, Assistants, Aides, or Sanitary Overseers in Sierra Leone, although there were two Sierra Leonean women in the Public Health Inspectors' course at the School of Hygiene. MOH agreed to recruit two female PCVs on a pilot basis. Graduates from the School of Hygiene were to be assigned as PCV counterparts.

Progress of the project is shown in the following chart.

Year	Volunteer Numbers	Volunteer Role/ Recruitment Criteria	Efforts and Accomplishments
1979	17 (10 additional)	Public Health Inspector Aides (PHI); M.P.H. or B.S. in Public Health, Health Education, Nutrition, Home Economics, or Biological Sciences	
	1	Environmental Health Inspector to teach water supply, environmental sanitation, health education at School of Hygiene-Freetown; Sanitary Engineer or B.S./M.S. in Public Health or Environmental Health	
1980	8 (additional	Community Health Workers/ PHI Aides	Designed and implemented needs assessments; organized village health committees; constructed demonstration latrine and well projects; gave secondary emphasis to nutrition education and maternal/child health.*
1981	15	Community Health Workers/ PHI Aides/Environmental Health Instructor	Trained 16 counterparts; held 60 health workshops; organized 105 village health committees; constructed: 60 wells, 45 village improvement projects, 372 village sanitation projects.**

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*TAC, 1980.
**CMP FY1982.

1982	18	Community Health Workers/ PHI Aides	Established 59 village health committees, mapped 38 communities, completed assessments of 28 communities, constructed: 423 latrines, 72 compost fences, 12 wells, 378 dish-drying racks, 1 goat corral.*
1985		"Planned"	Develop capacity of 180,000 people (200 villages in the South, 50 in the North, and 50 in the East) to provide for themselves: clean water, proper sanitation, protein-adequate diet.

Yearly expansion of the project was contingent upon availability of motorcycles for Volunteers, adequate resources for latrine and well construction (UNICEF, WHO, and CRS were assisting), and available counterparts, since not all chiefdoms had PHIs assigned. Other challenges included inadequate PCV language skills which hampered surveys, petrol shortages, and lack of per diem for counterpart PHIs. (CMP FY1981.)

In 1982, Community Health Worker pre-service training included learning how to organize health committees and to work through these committees to improve village sanitation. Trainees studied diseases related to poor sanitation, public health law in Sierra Leone, contamination of water sources, insects, and vectors. Practical exercises included conducting a sanitation survey and constructing latrines, drying racks, and compost fences. Training in 1983 for fifteen PCTs was to incorporate ten MOH trainees. (Morrow Letter, January 1983.)

AGRICULTURE

Peace Corps Volunteers had worked in agriculture and rural/chiefdom development since 1962. In the first half of the 1970s, Peace Corps' Management Unit for Rural Development also included agriculture. These two program areas included all of the water activities. A PC Rural Development Officer (RDO) was generally responsible for the development and coordination of PCV participation in rural development programs of the Ministries of Agriculture and Natural Resources, Works, Social Welfare, and Trade and Industry. (CMP FY1976.)

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*MOH/PC Health Program Annual Report, 1983.

Rice is the staple food of Sierra Leoneans, but in the early 1970s the country was not self-sufficient in rice production. If fully developed, inland valley swamps had the potential to meet national rice requirements, but at the time only 25 percent of the total swamp acreage was cultivated. (Development of Inland Valley Swamps, p. 2.)

The swamps were scattered all over the country, making it possible to involve the local people in the development of the swamps in their own areas. Development of inland swamps did not require the use of expensive machinery; most of the work could be done by hand with simple tools.

The traditional system of cultivation of these valley swamps used no water control, no fertilizer, and low-yielding varieties. These practices had to be changed if production was to increase. In particular, complete control of water was essential for a successful inland valley swamp development program.

Water control required clearing all vegetation, stumping, digging of drainage channels or realigning existing streams to facilitate flow of water, bunding, and simple irrigation by gravity. The purpose was to control the depth of water on the rice field.

The following projects in the agriculture sector demonstrate the supportive role of water activities in an integrated approach to rural community development and better health through better nutrition. At the time of this writing, agricultural extension Volunteers in Sierra Leone spend 80 percent of their time on irrigation systems and planning for swamp development. These Volunteers also assist in construction of village wells for the national rural water supply program as a secondary activity. (Watkins Interview, October 1983.)

Agricultural Extension Project (1971-present)

Collaborating agencies: Peace Corps, Ministry of Agriculture and Natural Resources, International Development Authority (IDA), World Food Program, Catholic Relief Services (CRS), U.S. Embassy Self-Help Fund

In 1974, with 18 Agricultural Extension Volunteers, Peace Corps, in collaboration with the Ministry of Agriculture and Natural Resources (MANR), began a program to teach new irrigation and drainage methods and rice cultural practices to subsistence level farmers working the inland valley swamps. (CMP FY1974.) These Volunteers were in addition to four PCVs already working in the IDA-financed Integrated Agriculture Project, a $4 million scheme to develop inland valley swamps, cacao production, and the cultivation of oil palms.

That year, Volunteer efforts successfully developed 480 acres of swampland with yield increases of twice and, in some cases, four times the previous output. This excellent record was attributed to the fact that PCVs were working with organizations such as the World Food Program, Tikonko Agriculture Extension Center, and MANR/IDA Eastern Area which provided tools and incentives (credit or food) to farmers working with PCVs. Support from the U.S. Embassy Self-Help Fund was high. CRS also contributed. (CMP FY1975.)

GOSL increased its support for this program to one-third the total required for all supplies and equipment. Two MANR Senior Agriculture Officers were assigned as technical advisors for Peace Corps' incountry PST and as supervisors of the new agriculture PCVs. An office in the Ministry was provided for the PC RDO. PCV housing was also provided. (CMP FY1974.)

The 1974-79 National Plan gave agriculture the highest priority, and Peace Corps programming did, too. With 20 Volunteers in the sector in January 1975, a request was placed for 40 trainees for the fall. Peace Corps planned to diversify its agriculture program to develop related agricultural systems in water supply, drainage, and sanitation, as well as storage, drying, and milling facilities.

The PC/SL agricultural extension program had grown from the "scatter-gun" approach to agricultural development involving little material support in the early 1970s, to a program with well-defined Volunteer responsibilities supported by GOSL and third party funding sources in 1978. During that seven year period, PCVs had assisted 2,500 small-holding farmers to construct irrigation and drainage systems covering approximately 4,000 acres; assisted farmers in doubling rice yields; stimulated vegetable, root, and tuber production by introducing alternate cropping and crop rotation; constructed over 20 grain-storage and farmer-organization centers to assist in marketing farmer produce; supervised the planting of thousands of fruit trees as cash crops for farmers and in school ag/science projects; helped train over 150 Sierra Leonean extension agents (an additional 30 were trained alongside PCVs during pre-service training); helped to organize, find funding for, and supervise various community development projects including piped village water systems and water well construction; initiated a national Ministry of Agriculture newsletter; and wrote a manual on rice production for extension agents. This Agricultural Extension Project is an acclaimed success model for Africa. (Project Summary Sheet, 1978.)

In 1978, there were 49 Volunteers in agricultural extension, assigned to the Ministry of Agriculture and Natural Resources. Volunteer qualifications ranged from a B.S. in any agricultural field with or without experience, to no degree with farm experience for at least four years. All PCVs were to be single; four could be women. Training consisted of nine weeks incountry with 120 hours of Krio (the dominant local language), cross-cultural orientation, and technical preparation in water-control methods and improved rice cultural methods. (TAC, 1978.)

Among many activities in 1978, Volunteers supervised the design and construction of water control systems on 1,000 acres of swampland and they took more than 120 farmers on field trips to introduce them to new rice-growing techniques and water-control systems in use by other farmers. (Project Summary Sheet, 1978.)

Small Farmers Project (1979-present)

Collaborating agencies: Peace Corps, Ministry of Agriculture and Forestry, Catholic Relief Services (CRS)

In 1979, Volunteers were still agriculture extensionists, but served in the newly-created Small Farmers Project under the Ministry of Agriculture and Forestry (MAF), formerly MANR. The project was administered by a steering committee composed of an MAF Officer (a National Coordinator), the APCD/Ag, and the CRS project officer. (CRS was the primary funding agency.) (CMP FY1981.)

Thirty-two PCVs and one MAF Agricultural Instructor (A.I.) were assigned to the project, which started in the Southern and Eastern Regions. Project A.I.s (Peace Corps and MAF) were assigned to a chiefdom or section of a chiefdom. They were responsible for recruiting interested farmers; granting them tools and PL 480 Food for Work to enable them to construct irrigation control structures in their swamps; surveying their cleared swamps; pegging the drains and bunds; supervising the work to see that it was being done properly; teaching farmers how to better prepare their land for rice cultivation; supplying loans for seed rice and, when needed, fertilizer loans; teaching farm families how to grow rice effectively under irrigated conditions; introducing improved means of weeding, harvesting, threshing, winnowing, tying, and storing rice; and advising farmers on marketing their surpluses. They also worked with entire farm families to introduce improved varieties of other staple crops and teach new cultural practices. They helped farmers form associations that could help them meet needs collectively which they could not meet individually. (CMP FY1981.)

The A.I.s did all of these jobs with the assistance of trainee MAF agrotechnicians. Graduates of agricultural training centers were assigned to PCVs as counterparts for a period not to exceed two years. Volunteers had one to three agrotechnicians assigned to them. (CMP FY1981.)

Recruiting criteria for agricultural extension agents in 1980 were the same as those for 1978-79, with the exception that now ten could be women and there could be one married couple. The training period had increased to ten weeks of intensive technical, extension, language, and cross-cultural training in a rural village site. (TAC, 1980.)

Since the Small Farmers Project was so successful, it was expanded in 1980 to cover the entire country. CRS planned to fund the project for another three years.

Starting in 1980, Volunteers were to provide on-the-job training in technical and extension fields to 100 agrotechnicians per year and work with 1,000 farmers each year to develop over 1,500 new acres of inland valley swamps. In particular, Peace Corps planned to target female farmers for extension efforts in vegetable and rice production. Women, who did half the agricultural work, had received little technical assistance from the MAF extension service. Peace Corps wanted to introduce time- and labor-saving implements and practices to these women. By directing their efforts at the gardening which women did, Peace Corps aimed to increase both women's incomes and the nutritional content of their families' diets. (Project Summary, 1978.)

In 1981, the agriculture program, with almost entirely skill-trained Volunteers doing extension work in swamp rice cultivation, accounted for almost one-third of PC/SL's Volunteers. It had become a successful model in generalist programming. The Volunteers' scope of work had expanded from extension work in inland valley swamp rice development alone to include other crops, as well as work in forming farmers associations. Female Volunteers had brought a new orientation toward working with female farmers. (CMP Review, 1979.)

In 1982 the Small Farmers Project involved 400 families in extension activities affecting 600 acres, 300 of which were developed that year.

Community Swamp Development Project (CSDP)

The Community Swamp Development Project (CSDP), begun in 1979, operates within the structure of the Small Farmers Project, but works with village self-help groups for the development of communal swamps and rice production to benefit the community. (CMP FY1983.)

In 1982, the project established 20 new community swamps involving 50 acres and 800 farm families; continued development of 80 acres involving 1,000 farm families; trained 25 agrotechncians; and established self-help committees in all 50 CSDP villages.

PC/SL anticipates that by 1985 there will be little need for PCVs in swamp development, due to increased participation by Sierra Leoneans.

PEACE CORPS/SIERRA LEONE

Community Participation

All water and sanitation projects require the villagers to provide unskilled labor and local materials for construction. In addition, two communities have effective environmental sanitation education programs which work with villagers to establish community participation in construction and maintenance. In these programs, villagers select committee members who are trained to educate and organize the community during siting, construction, and maintenance phases. The education programs are now expanding into latrine construction and water quality activities. (Morrow, May 1983.)

Collaboration

Volunteers were involved in projects supported by Ministry of Agriculture and Forestry, Ministry of Energy and Power, Ministry of Works, the Ministry of Health, Ministry of Social Welfare, UNDP, WHO, UNICEF, CARE, CRS, mission hospitals, FAO/WFP, AID, EEC, CUSO, the World Bank, IDA, and the Federal Republic of Germany.

Government ministries, Peace Corps, and representatives of the UNDP worked together in determining water and sanitation needs, the development of infrastructure, and project implementation. The IDA and EEC funded Integrated Agricultural Development Projects which provided an infrastructure with material support in which PCVs successfully worked.

Ministry officials at all levels work directly with PCVs, supervising them, making site visits, attending monthly meetings with them. GOSL officials help in pre-service and in-service training and keep program staff appraised of problems and accomplishments. (CMP FY1983.)

Training

Sierra Leone uses the village-based training model (see Appendix E.4), selecting small rural towns/villages as training sites to expose trainees to the typical Sierra Leonean lifestyle and to assist them in learning the local language. Each year new rural village sites are selected to promote wider exposure of Peace Corps' programs and to develop the infrastructure of the sites through "hands-on" training related to construction of wells, latrines, and compost pits. Thus, from the beginning, trainees learn to work in a Sierra Leonean environment, living with a family and working with local resources.

The agricultural technical training is based on a model from the International Institute of Tropical Agriculture. The extension training has been produced from the experience of Volunteers, using hands-on activities. The technical manual for swamp development and rice production, the extension manual, and field book were all produced by PCVs. Health training has sometimes been held jointly with Peace Corps/Liberia. (CMPs FY1981, FY1983.)

In 1979, all rural development and health Volunteers were trained in one program. Previously, trainees had been trained in small isolated groups of two to six--engineers, nurses, health education, community health workers, mechanics, or hygiene instructors. In 1980, Sierra Leoneans moved into training positions formerly held by PCVs, such as project manager and site administrator.

PC/SL would like to have additional in-service technical training and is soliciting collaboration from WASH for a sanitation workshop to be held in November 1983. PC/SL also plans to request workshops in spring capping, handpumps, and rainfall harvesting.

Women in Development (WID)

Women are participants in all environmental health activities and are members of village health committees. They participate in all decision-making processes, including siting of wells. They also serve as members of well maintenance committees. Women are the primary targets of health education activities and are the direct beneficiaries of a safe, adequate, more convenient supply of potable water. (CMP FY1983.)

Women are not primary beneficiaries of agricultural extension because women do not have land tenure. In fact, a larger crop may simply increase the work load of the women in the family, as they are responsible for harvesting and threshing. The land tenure system inhibits the improvement of this situation. This project does assist women in improving their families' nutrition through kitchen gardens made possible by the irrigation systems. (O'Malley, Status Report on WID.)

Volunteers formed the Female Extension Workers (FEW) support group to improve the role of women in the Small Farmers Project. A number of WID conferences have been designed and implemented by Volunteers. A WID committee is networking with local women's organizations to serve as resources for village women. (CMP FY1983.)

Female PCVs are serving in all capacities in the program, from regional project managers to environmental education workers. In FY83, PC/SL will actively recruit married PCVs to work as teams in regional IADPs. (Sierra Leone Rural Water Supply Project Description, 1982.)

ANALYSIS*

Peace Corps water supply activities have a long history in Sierra Leone; the introduction of sanitation and health education activities is more recent. In general, these programs illustrate a successful Peace Corps integrated programming approach in water supply, sanitation, health education, and nutrition.

Aspects Contributing to Project Successes

- The government of Sierra Leone was very supportive of Peace Corps in the initial stages of Volunteer involvement in water supply projects. Although there were problems arising from the weak organizational structure of some ministries, overall support by the government for these projects was evident.
- Counterpart training was built into the water-supply program. Skills were passed on to local personnel who could then carry on the work independently.
- At the village level, training was conducted in maintaining handpumps.
- The village water supply survey conducted by Peace Corps Volunteers provided a basis for determining water needs in rural areas and supported fund-raising efforts with international donors.
- Village self-help and contributions of locally available materials were conditions of Peace Corps involvement in water supply projects.
- Outside funding for IADPs provided well-run and supported projects, making it possible for Volunteers to contribute the village water supply component.
- The eventual transfer of all water supply projects to the Ministry of Energy and Power (MEP) helped to clarify the chain of command in this sector.
- The establishment of the National Committee for the International Water and Sanitation Decade with Peace Corps participation contributed to water and sanitation programming efforts.
- The eventual introduction of sanitation and health education components to Peace Corps activities expanded the benefits of these activities to communities.

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*By Joseph Gadek and Diana Talbert

- The establishment of the Rural Water Supply Division in the MEP provided a collaborating unit with goals similar to Peace Corps' in water/sanitation.

- Volunteers helped establish community health committees in many villages whereby the villages conducted their own needs assessment and prioritized their development projects.

- Good language training enabled Volunteers to live and work effectively in the rural areas.

- Sierra Leone's village-based training was successful in preparing Volunteers and developing villages at the same time.

- Peace Corps/Sierra Leone had a low Volunteer-to-staff ratio in 1977, providing opportunity for strong, innovative programming efforts.

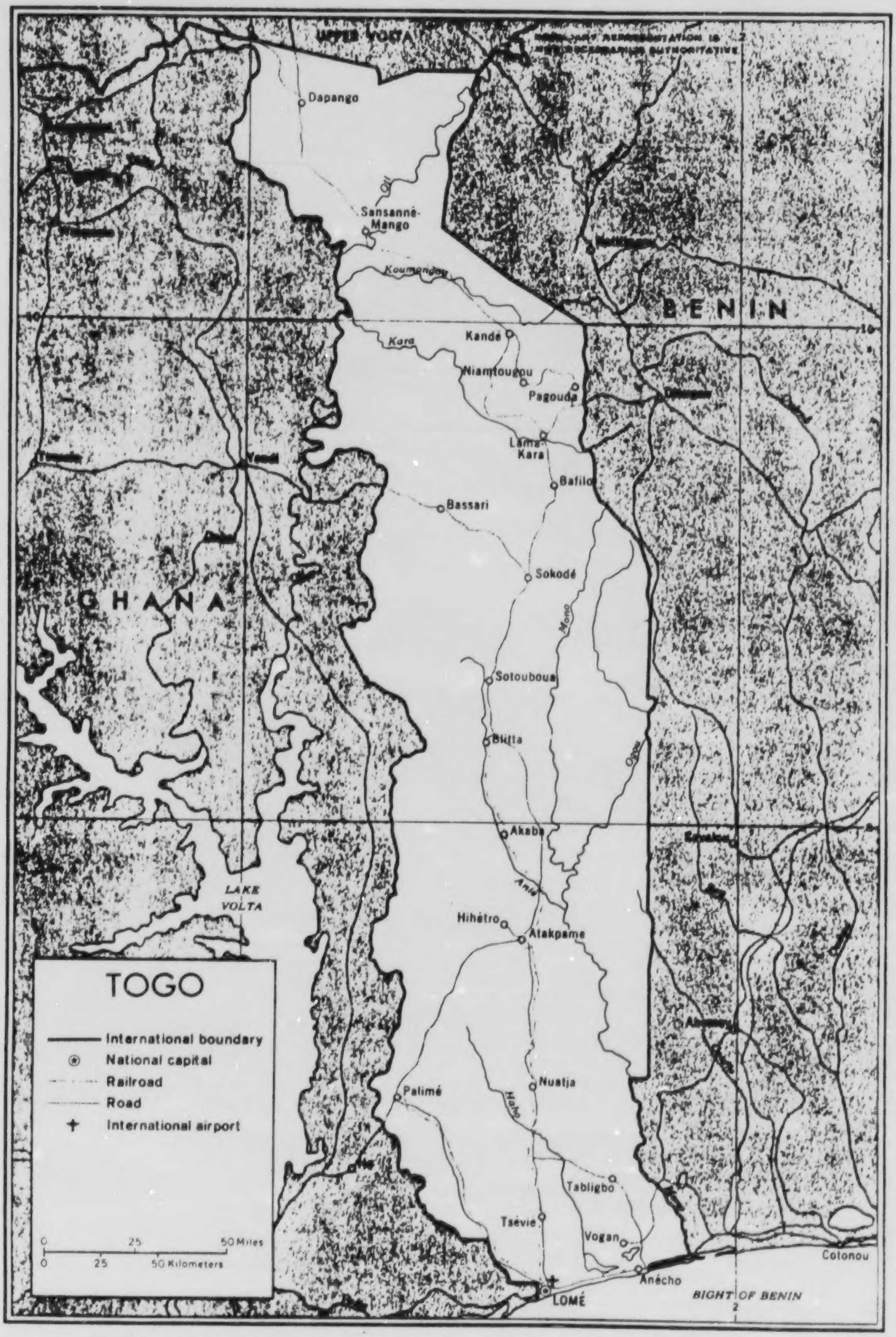
- Peace Corps/Sierra Leone was adept at recruiting generalists or professionals as appropriate for the role requirements. Programming was flexible.

Aspects Hindering Project Successes

- Initially, there were several different ministries engaged in activities to provide rural and urban areas with clean water and sanitation. Project administration was difficult with so many areas of responsibility to coordinate.

- Women were not conscientiously recruited until well into the Peace Corps health education/environmental sanitation programs, nor were women addressed directly as the beneficiaries of these projects.

REPUBLIC OF TOGO
CASE STUDY AND ANALYSIS


UPPER VOLTA
BOUNDARY REPRESENTATION IS NOT NECESSARILY AUTHORITATIVE
Dapango
Oti
Sansanné-Mango
Koumongou
BENIN
Kandé
Kara
Niamtougou
Pagouda
Lama-Kara
Bafilo
Bassari
Sokodé
GHANA
Mono
Sotouboua
Blitta
Ogou
Akaba
Anie
LAKE VOLTA
Hihétro
Atakpamé
Palimé
Nuatja
Haho
Tabligbo
Tsévié
Vogan
Anécho
LOMÉ
Colonou
BIGHT OF BENIN
TOGO
International boundary
National capital
Railroad
Road
International airport
0 25 50 Miles
0 25 50 Kilometers
10
8
2

From Background Notes: Togo, United States Department of State, Bureau of Public Affairs, March 1981.

COUNTRY BACKGROUND*

Geography

UPPER VOLTA
BENIN
NIGERIA
TOGO
GHANA
Lomé
Gulf of Guinea

Togo, a country of 56,600 sq. km (21,853 sq. mi.), is only 160 km (100 mi.) wide at the broadest point. The terrain consists primarily of two savanna plains regions separated by a southwest-northeast range of hills.

Togo's climate is tropical. The south is humid, with temperatures ranging between 23°C and 32°C (75°F-90°F). In the north, temperature fluctuations are greater--from 18°C to more than 38°C (65°F-100°F).

People

The population of Togo was estimated in 1979 to be 2.5 million, with an annual growth rate of 2.77 percent.

Population distribution in the Republic of Togo is very uneven due to variations in soil, terrain, and water availability. Generally, population is concentrated in the south. However, in some areas in the north where potable water is available, population density reaches 200 to 300 per square kilometer. In the central zone, population density is often less than 15 per square kilometer. The prevalence of onchocerciasis ("river blindness") in some river valleys has prevented settlement in certain areas or led to the abandonment of villages. These differences reflect disparities which have historic and socioeconomic precedents and result in regional overpopulation, ecological stress through soil depletion, and regional inequalities in the distribution of income. (Togo CDSS, FY1983, p.1.)

The people of Togo are heterogeneous in terms of language and culture. Though French is the official language, many local languages are spoken. Togo has 21 major ethnic groups. The ethnic groups of the coastal region, particularly the 330,000 Ewes, are culturally dominant, although they are a distinct minority. The southern Ewe and Mina tribes are especially well represented in government and commercial activities. The major northern ethnic group is the Kabye, who live on submarginal land. The Kabye have traditionally emigrated from their home area in the Lama-Kara region to seek employment.

Age distribution is uneven. More than one-half of the Togolese are under 15 years of age.

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*Excerpted from Background Notes, U.S. Department of State, Bureau of Public Affairs, July 1982.

N.B. Special thanks to Kelly Morris for updating this case study.

Government

The present Togolese government is a highly centralized system that rules by decree and ordinance. The executive branch is headed by the President who serves as Chief of State and leader of the sole political party. The President appoints all cabinet ministers. For administrative purposes, Togo is divided into 22 Prefectures, each with a Director appointed by the President.

The legislative body is the National Assembly, created in 1980. The Togolese judicial system is modeled on the French pattern. The highest review court is the Supreme Court, headed by a Presidential appointee.

When President Eyadema assumed control in 1967, political parties were banned and all constitutional processes were suspended. The country took a step toward resuming party rule in late 1969, when a single national political party, the Assembly of the Togolese People (RPT), was formed. President Eyadema was elected national President of the party on November 29, 1969. The RPT has the support of many of the leaders of the former political parties, and all Ministers have been integrated within the party. Since 1969, the party has taken control of women's, youth, and labor groups by creating party structures to replace or supervise existing groups. Party committees are found in almost every village in the country, and often sponsor self-help development activities and promote political education.

At present there is universal suffrage.

Economy

Togo's GDP (1978 est.) is $765.5 million, with an annual growth rate of 8 percent. Per capita income (1978 est.) is $319. In 1983, Togo requested and was granted reclassification from Third World to Fourth World (poorest) country for development aid purposes. The foreign debt is $1 billion.

The Physical Quality of Life Index (PQLI)* is 34. The PQLI for the 24 PC countries in the Africa Region ranges from 17 to 73; Togo ranks tenth.

Agriculture constitutes 45 percent of the GNP. Principal crops are yams, manioc, millet, sorghum, cocoa, coffee, and rice.

Subsistence agriculture is the dominant economic activity in Togo, with most Togolese participating only marginally in the cash economy. Cocoa and coffee, the only significant export crops, are grown in the rain forests of the hill region. The government has placed increased emphasis on agriculture in the last few years. Coffee and cocoa replanting programs should begin to raise production in the early 1980s.

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*The Physical Quality of Life Index (PQLI) was developed by the Overseas Development Council as a non-income measurement that summarizes many aspects of well-being. The PQLI is calculated by averaging indexes on a scale of 0 (the most unfavorable performance in 1950) to 100 (the best performance expected by the end of the century) for infant mortality, life expectancy, and literacy into a single composite index.

Industry constitutes 21 percent of the GNP. Aside from trade, the most significant nonagricultural economic activity is mining. Over 3.3 million metric tons of phosphates were shipped in 1980 from a large deposit and processing facility near the coast. Togo has substantial limestone deposits and a blockmaking plant, which could supply the needs not only of Togo but of other nearby nations. Offshore oil exploration continues and an oil refinery has opened near the recently expanded port of Lome.

Foreign investment is now concentrated in the trade and service sectors. However, Togo is actively seeking more capital investment, particularly in industry, and is prepared to participate in joint ventures with foreign investors. France is Togo's principal trading partner. Other EEC countries are important suppliers and customers. U.S. trade with Togo is modest. To overcome the restrictions of a limited market and sparse resources, Togo has supported wholeheartedly the formation of the Economic Community of West African States (ECOWAS).

A large volume of foreign assistance is available to Togo. Togo's principal sources of development assistance have been France, the European Development Fund, the Federal Republic of Germany, the United States, and the World Bank. In 1972, the People's Republic of China (PRC) extended Togo a $46 million line of development credit. This is being utilized in irrigation and rice and sugar production schemes. PRC also provides substantial technical assistance in medicine.

Although the government budget was balanced from 1968 to 1971, a decline in business activity produced a deficit in 1972-73. Following the nationalization of the phosphate mining company in 1974 and the sudden rise in the world price of phosphate, anticipated government revenues rose 88 percent between 1974 and 1975, and the budget has been balanced since. In recent years, borrowing for Togo's development program has brought Togo's debt-service ratio up to 21 percent of export earnings. Togo planned a debt rescheduling through the Paris Club in 1981.

Water/Sanitation

Water

Rural Togo suffers from a lack of sufficient water for both human consumption and agricultural purposes. Only 16 percent of the population had access to safe water in 1975. The dry season lasts from five to eight months, causing much surface water to disappear and many wells to go dry. In rural areas, water for both domestic and agricultural use is strictly rationed during the dry season. Drawing and carrying of water, in some cases as far as 20 kilometers, consume much time and energy. The limitation imposed by scarcity of water affects all villagers more or less equally, although by custom, women and children have the responsibility for drawing and carrying water. During the dry season, women who have walked many kilometers may wait all night for water to seep into muddy holes. (Togo CDSS, FY1983, p. 3.)

It is often difficult to reach water, due to the nature of the terrain. In many areas of Togo, hard rock layers must be pierced before finding aquifers and, in other areas, it is often impossible to find potable water at any depth. Where there is no accessible underground potable water, it is necessary to make dams for streams and rivers, and catchment basins for rainwater runoff. Dam and basin building, however, have the potential for increasing the number of malarial mosquitoes, spreading guinea worms, and increasing the incidence of schistosomiasis. (CMP FY1978, p. 5.)

Water is not only scarce, it is often contaminated. It is not unusual during the rainy season for many farmer families to fetch water from nearby marshes, which are most often polluted. Farmers may also draw water, when it is available, from open, hand-dug wells. Before the rainy season, people must walk to the rivers where they bathe and wash clothes before drawing water to carry home. The animals drink at the same source. The contamination of rivers is further increased by human and animal wastes. (USAID Project Paper, 1979, p. 5.)

Lack of adequate water supply has great economic impact in the agricultural sector in two ways: human labor is diverted from more productive work to collecting water, and there is no irrigation to increase the land area under production. An inordinate amount of human labor is spent providing for the rural family's most basic drinking and bathing water needs. This necessity means that not only are energies diverted from agricultural work, but the condition of life in rural areas discourages young people from remaining there. (CMP FY1979, p. 3.)

Left to its own limited resources, the rural population cannot cope with the problem of obtaining safe water. The government, faced with its own personnel and budget constraints, has sought external assistance. The first responses were principally in the form of research and test wells. Between 1965 and 1975, the United Nations Development Program (UNDP) financed several studies and test wells. During the 1968-71 period, with Swedish bilateral technical assistance, exploratory wells were put down and pumping tests were made. During 1972-73, British bilateral development assistance provided nine tubewells. Between 1974 and 1976, the Canadian International Development Agency (CIDA) funded hydrogeologic studies, pumping tests, and some production tubewells.

Other assistance provided more direct benefits to the people. The German National Development Bank funded the construction of a municipal water supply system for the city of Sokode. Further north on the Kara River, a French company began constructing a dam, a reservoir, and a distribution system. This dam not only provided water to the three prefecture capitals in the area, but also to dozens of rural villages in the region, providing clean drinking water to between 100,000 and 200,000 people. To provide water for the hitherto neglected rural population, the Fond Europeen de Developpement (FED) financed the construction of some 500 open wells for village water in the area north of the coastal, or maritime, region. (USAID Project Paper, 1979, p. 5.)

In addition, there were a number of church and private well-digging projects. The Evangelical Church project in the Plateaux Region, the Catholic Church project in the Savannah Region, and an OXFAM project conducted in the Central and Lama Kara Regions are examples. (CMP FY1979, p. 18.)

Togo Water Supply Program

In the mid-1970s, the Government of Togo (GOT) began taking steps to develop its own water supply program. In preparing a program for the provision of water to Togo's rural population, the Water Power Service surveyed the water resources and needs of the country and learned that 65 percent of the rural population lived in villages of fewer than 500 inhabitants. Nineteen percent were in centers having between 500 and 1,000 people, and 12 percent were in towns of 1,000 to 2,500. To provide safe water to these groups scattered throughout the country, 3,500 wells were required. The Service recommended that small bore tubewells be installed rather than open wells, many of which run dry during the year and all of which sooner or later become contaminated. (USAID Project Paper, 1979.)

The five-year Economic and Social Development Plan (1976-80) gave water the highest priority, five percent of Togo's total investment. However, 85 percent of the funds to be invested in water resources were allocated to the urban area and 15 percent to the water needs of the rural poor, who constituted 85 percent of Togo's population. (WHO Water Sector Digest, Togo, 1979.)

In 1976, urban water supply was controlled by the Togo National Administration of Water. Piped water was supplied to four district capitals and the capital city of Lome. The plan for 1976-80 included the provision of piped water for the rest of the district capitals and for expansion of the existing systems. (In 1983, almost all of the district capitals have piped water and electricity and have paved road access.) The construction of dams, filtration plants, pump stations, and pipelines was conducted entirely by contract to private enterprises, usually entirely or partially foreign-owned. When completed the water supply system was taken over by the National Administration of Water. (CMP FY1978, p. 5.)

The rural water supply effort was budgetted to receive $800,000 per year between 1976 and 1980. However, it was not clear how the money was to be allocated, who would spend it, or where. There was little interagency coordination or defined strategy due, perhaps, to the large number of Togolese agencies which shared responsibility for rural water supply.

Health

Sanitation needs require substantial development effort. National statistics indicate that 33 percent of all medical visits are due to waterborne diseases. (WHO Water Sector Digest, Togo, 1979.) The water-related diseases of schistosomiasis and onchocerciasis are numbered among the six major communicable diseases in the country. (USAID Project Paper, 1969, p. 4.) Problems exist in both urban and rural areas.

In the urban areas, administrative and commercial buildings and a few houses have septic tanks. In populous neighborhoods, latrines are used. A bucket latrine system, adopted and maintained in Lome, was banned in 1981. Now all latrines or toilets must empty into a holding tank which the city sanitation department pumps out and dumps in the ocean. In the rural areas, latrines are the exception rather than the rule. (WHO Water Sector Digest, Togo, 1979.)

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Togo's 1970-75 National Development Plan Health Sector called for:

- a permanent network of medical units;
- environmental sanitation: introduction of personal and social hygiene to the entire population, collaboration with the national service responsible for the development of wells, provision of potable water for the population in the outlying rural sectors, and installation and maintenance of public latrines and garbage pits to reduce fecal contamination;
- eradication of communicable diseases;
- maternal and child health: integration of these activities with those of the Basic Health Services in the rural areas, and organization of a school hygiene service;
- better equipment and services offered by laboratories and the statistical department;
- promulgation of health education concepts to the population; and
- creation of Togo-Pharma regional supply centers for the distribution of medical supplies and pharmaceutical products to outlying health centers and dispensaries. (CMP FY1970-73.)

Implementing Agencies

Several government agencies share responsibility to some degree for water supply abd sanitation:

- the Water Power Service of the Ministry of Public Works (Service Hydraulique);
- the Sanitation Service of the Ministry of Public Health (Service d'Assainissement);
- the Rural Engineering Service of the Ministry of Rural Equipment (Genie Rural);
- the Rural Animation Service of the Ministry of Rural Development (Animation Rurale);
- the Social Affairs Service of the Ministry of Public Health (Affaires Sociales);
- the five regional development units of the Ministry of Rural Development (SORAD/O.R.P.V.);
- the Togolese National Red Cross (Croix Rouge Togolaise);
- the National Water Service (RNET).

In general, the agencies which had the most well-digging or dam-building equipment (Water Power Service and Rural Engineers) were limited in the number of projects they could undertake because of inadequate resources and high costs. The other agencies could implement low per-unit-cost wells using village self-help labor and trained or trainable personnel, but lacked resources such as building materials and tools, such as jackhammers and/or dynamite, to pierce rock layers.

In 1977, the Common Market's Development Fund (Fonds Europeen de Developpement/FED) provided grant money for boring 1,000 wells all over the country. USAID also expressed plans for financing a village well-digging project.

OVERVIEW OF CASE STUDY PROJECTS INVOLVING WATER/SANITATION*

Name	Year(s)	Goals/Activities	Size**
Rural Community Development/ Rural Infrastructure Program	1963-present	PCVs supervised construction of dug wells, trained counterparts in construction techniques and maintenance, and initiated village sanitation programs. They were agricultural extension agents, community development agents, and architects working in areas from animal traction to school construction.	Small
Health Education Project	1969-78	Volunteers promoted preventive medicine through health education in schools and dispensaries. They developed manuals and posters still in use today. PCVs also constructed latrines, wells, and cisterns.	Medium
Rural Water Supply Project/ Environmental Sanitation Project	1981-present	USAID-funded community development/education project in Ministry of Social Affairs supervised by Peace Corps. Objective is to organize villages to maintain well pumps, construct family latrines, and organize health/sanitation campaigns.	Medium

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*This information is taken from Phase I, the Summary of Peace Corps Water and Sanitation Activities from 1970 through 1982.

**Project size is indicated as follows: "Small" represents under five Volunteers; "Medium," 6-12; "Large," 13 or more. Number of Volunteers varied from year to year, therefore this label indicates an average.

TIMELINE OF SIGNIFICANT EVENTS COVERED IN THE TOGO CASE STUDY

	1962	Peace Corps Entry
Rural Community Development/ Rural Infrastructure Program begins with the Wells Projects	1963	
School Construction Projects start	1967	
	1969	Health Education Project begins
SORAD begins	1970	
	1977	Health Education Project ends
Wells Projects end	1979	
	1981	Rural Water Supply Project Health Education and Village Sanitation Activities

HISTORY OF PEACE CORPS WATER/SANITATION ACTIVITIES

Peace Corps entered Togo in 1962 with programming in the Rural Community Development Sector. The program consisted of a broad range of projects including well digging, school construction, agricultural extension, animal traction, and sanitation and health activities. Generalist Volunteers have been skill-trained and have worked successfully at the village level from the beginning. PC/Togo has strongly encouraged documentation and exchange of country/region-specific information on wells and health education.

RURAL COMMUNITY DEVELOPMENT

Rural Community Development/Rural Infrastructure Program (1963-present)

This program focused in two areas: Wells Projects and School Construction Projects.

Collaborating agencies:* Peace Corps; Ministry of Rural Economy, SORAD; Ministry of Public Works; Ministry of Education; U.S. Embassy Self-Help Fund; Peace Corps Partnership Program; Social Affairs Service; Water Power Service; FED; OXFAM

In Togo, the problems of agriculture, transportation, education, and health are closely intertwined. Therefore, Peace Corps planned to assist in upgrading the general living standards through rural community and infrastructure development. Objectives were to help increase the water supply of Togolese villagers for agricultural and family use, to support a program to increase fish supply and hence protein consumption in northern and central Togo, to aid in the reduction of insect damage to stored crops, to assist in a program to increase the quality and quantity of instruction available to a nation which had more youths than adults, and to concentrate on health education and preventive medicine on the village level. (CMP FY1970-73.)

Togo's small geographic size, poverty, and level of development were reflected in weak or embryonic institutional structures. Since Peace Corps' aim was to work within existing structures and to attempt to sustain their development slowly, it was felt that too great an influx of Volunteers in the early stages would be neither supportive nor supportable. Therefore, numbers of Volunteers in projects remained small, one to three arriving at a time. The Rural Community Development/Rural Infrastructure Program, begun in 1963, recruited Volunteers to be agricultural extension agents, farm business trainers, construction supervisors, architects, community development agents, and well-diggers. Volunteers were to work on every aspect of rural development from animal traction to school construction. (TACs.)

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*Agencies may collaborate on projects in a number of ways: funding, such as by the World Bank, EEC, USAID; as part of a cooperative effort such as with CARE, CRS, CUSO; or a signed agreement such as with TransCentury Foundation or a Ministry of Health.

water, the water table was too deep, or layered rock prevented digging, making well construction unfeasible.

Volunteers assisted with construction of an average of three to four wells per year, plus rehabilitation of a number of caved-in wells. SORAD furnished masons, but not counterparts as such. Higher level personnel were assigned to work on other agricultural projects. Peace Corps helped the Services of Social Affairs and Hygiene to train agents in well-digging. The Hygiene Service contributed a work site for the construction of casements.

Assessing the program in 1970, Peace Corps felt there was considerable support from the GOT in the form of money, masons, and transportation. Thus, there was a high degree of Volunteer satisfaction and PC support of the Services of Hygiene and Social Affairs. Basic human needs were met by providing water to anywhere from 200 to 1,000 people per well. Better health in terms of freedom from guinea worm and schistosomiasis, liberation of human energy, and development of self-help skills among villagers were observable pay-offs.

The PCVs who trained and entered service in 1973 were successors to the by-then defunct Maritime Region Program (with SORAD and Hygiene and Social Affairs). They were assigned to the Sanitation Service of the Ministry of Health (for wells and latrines); a small-bore well-drilling program in the Plateaux Region with the Eglise Evangelique/Projects Techniques et Sociaux at Hihetro; and to the Rural Animation service.

Volunteers in the Eglise Evangelique well-drilling program did site surveys, supervised construction, trained counterparts, and trained villagers in water pump maintenance.

Counterparts received a minimum wage while being trained over a six month to two year period. Generally these counterparts took over when PCVs left.

Villagers requested the well-drilling teams and villagers were involved in site selection, contributed $100, provided labor, and supplies, food, and lodging for the project team. Drilling equipment was adapted to Togolese production capability from a Southeast Asian hand auger design.

Five teams covered a 100-mile radius and completed 100 wells serving approximately 30,000 people between 1973 and 1975. (Questionnaires.)

Wells Conference. In 1974, a conference was held in Togo for wells Volunteers throughout West Africa. A few staff members attended, as well as two outside water experts. The workshop was a working technical meeting where technical information was exchanged and common problems were shared. Chad, Senegal, Upper Volta, Niger, and Togo were represented. Samples of village contracts were presented and discussed. How-to's for large diameter wells, small-bore wells, pump installation, and the use of dynamite were shared and recorded. Following the conference, the information was reproduced in a Special Issue of the Peace Corps *Program and Training Journal* entitled *Wells Manual*. The Volunteers found the conference highly beneficial and recommended one be held every two years. (Program and Training Journal, 1975.)

Planned but not implemented. A project was designed in 1978 to set up village well-digging teams (working with PCVs and Social Affairs Service

Following are the water/sanitation related subprojects that made up this multifaceted program.

Wells Projects (1963-79)

The well-digging projects began in 1963 when a former Peace Corps Volunteer negotiated a written agreement between the U.S. Embassy and the Ministry of Rural Economy. Under this accord, the Embassy supplied the necessary funds to buy and maintain equipment while SORAD, the development agency within the Ministry of Rural Economy, funded the purchase of materials, transport, and masons' salaries. (CMP FY1970-73.)

Goals of the Wells Project, in addition to increasing water supply on the village level, included developing followup programs for village sanitation, increasing cooperation with local administrations, training of masons in concrete methods, placement of pumps, and covering of wells. The wells varied from 25 to 90 meters in depth. The villagers did the digging and a well-digger/mason did the casing. There was generally a problem installing pumps in these wells because of their depth.

The Wells Project was originally confined to the area surrounding Lome. When it became regional, it was placed under SORAD. From 1968 through 1970, the GOT provided three million CFA (local currency) in support of the project, and the U.S. Embassy provided $10,000 per year in self-help monies, allocated through the Ministry of Public Works to SORAD in the Maritime Region.

In 1970, SORAD was still a new organization struggling to gain the acceptance of the population. By that time, Peace Corps was involved in SORAD activities in two regions, Maritime and Kara. In the SORAD Maritime Program, Peace Corps involvement was limited to well-digging, with three Volunteers involved. (CMP FY1970-73, p. 6.) In the Kara Region PCVs were rural development agents for SORAD. When SORAD took over development activities in the region, the National Development Service, which had previously been responsible for this work, was dissolved. Volunteers were accepted as SORAD agents, but their exact status in SORAD was never very well defined.

The three Volunteers remaining in this project in the early 1970s were extendees who were quite satisfied with their roles despite the frustrations of growing with a new agency. They were involved in gardening, poultry production, and construction of community centers, schools, markets, and bridges. Many of these activities were financed by U.S. Embassy Self-Help grants. (CMP FY1970-73, p. 8.)

Organization of well-digging teams was the responsibility of the Volunteer in each village. Working through village chiefs and elders, the PCV helped villagers to organize, ordered materials, trained masons, and supervised construction. The Volunteer's most important role was maintaining good relations between SORAD, village and regional authorities, and villagers.

Villages were selected from those that requested assistance from SORAD or Prefecture, or at the suggestion of an agriculture agent. Geology played a role in selection, since some areas in the Maritime Region yielded salty agents) which would dig traditional large-bore wells, but dig them to the (larger) diameter and specifications of the National Water Power Service (NHS). This size adjustment was made so that the NHS could help with problems in both digging and maintaining the wells. Previously, NHS had been willing and able to help the villages, but village wells were usually too small for NHS equipment.

A team including one PCV and several Water Power Service technicians would staff a "mobile unit"--truck, compressor, jackhammer, dynamite, etc.--based at the regional capital and go to village sites to help villagers penetrate rock layers or solve particularly difficult construction problems. A maximum of the project budget would go to finance village-level, labor-intensive self-help efforts, while the "high tech" equipment was on-site only when needed.

PC/T had excellent cooperation in designing this project from the GOT, Social Affairs Service, and the Water Power Service. The FED representative visited OXFAM at Oxford and arranged a three-year financing plan from the Common Market's Private Voluntary Organization Micro-Project Fund with OXFAM the cooperating PVO. Unfortunately, the appropriate papers were not processed by Togo OXFAM in time and the project was delayed.

In the meantime, four PCVs were trained for this project, with excellent GOT participation and cooperation, and began PC service in January 1979. They initially operated with U.S. Self-Help money while awaiting Micro-Project Fund monies, but eventually all transferred to other programs when the project did not materialize. (Morris, 1983.)

School Construction Projects (1967-present)

The School Construction Project began in 1967 as the need for more schools accelerated sharply. Construction in the project was not limited to classrooms; over the years, Volunteers built more than 1,300 classrooms in rural villages, 100 clinics, and numerous markets, bridges, wells, cisterns, and latrines. (Project Summary Sheet, FY1982.) Volunteers in the project grew from five in 1973 to 17 in 1978. Volunteers were exclusively male by request of the GOT until 1978. Groups since have had female Volunteers.

The 1978 community development trainees received 11 weeks of in-country training. The first four weeks were spent in intensive French language training, followed by a one-week live-in with a construction Volunteer. During the remaining six weeks, training included language training, work on a village school building site, work with Togolese artisans, orientation to the Togolese Government structure, and training in community development techniques. During these six weeks, the trainees lived with a Togolese family learning language, customs, and mores. (Community Development Agent TAC, 1978.)

During 1978, Volunteers in this project assisted in the construction of more than 60 rural primary school classrooms with accompanying cisterns and latrines, revised the standard PC school construction plan, and constructed two prototype models. (CMP FY1980.) In 1979, there were 17 Volunteers, one of whom was a civil engineer recruited to supervise the construction of rural small dams.

By 1981, construction costs had soared with inflation. PC/Togo felt that unless outside funding in addition to the U.S. Embassy Self-Help Fund could be found to maintain the level of construction, numbers of Volunteers in this project would have to be reduced. The U.S. Embassy Self-Help Fund did, in fact, support the construction of 37 primary school classrooms in 1981 and eight new trainees were requested. One Volunteer was recruited to serve as architect-in-residence in the office of the Social Affairs Ministry in Lome.

The American Embassy had, for a period of time, taken over the responsibility of project selection. However, as of 1982, site selection was no longer to be based simply on available financing from the U.S. Embassy Self-Help Fund or Peace Corps Partnership assistance. Criteria for site selection included expressed need, population growth, and the assignment of counterparts to be trained in the use of a standard construction plan and cost estimate.

As Volunteers worked themselves out of the day-to-day operations of classroom construction with counterparts taking over, they began to focus more on low-cost, farm-to-market road improvement.

In 1982, there were seven Volunteers in the program. Training had increased to 12 weeks incountry. (CMP FY1984, p. 21.)

Eleven new Volunteers entered the program in 1983. The program ranked fourth in Peace Corps/Togo priority.

Rural Water Supply Project (1981-present)

Collaborating Agencies: Peace Corps, Ministry of Social Affairs, USAID

In the spring of 1981, USAID's Rural Water Supply Project started in Togo. The goal of the project was to improve the health of the rural population by reducing the incidence of water-borne diseases. One objective was to provide an adequate supply of safe water to approximately 160,000 rural poor, thus eliminating the need to draw water from contaminated sources. A second objective was to provide health education and village sanitation, including the construction of family latrines, in every village where a project well was installed. (USAID Project Paper, 1979.)

The FED was sponsoring a project to provide 280 tubewells in all five regions. The UNDP was doing a survey and some borings in the Central and Plateaux Regions. USAID proposed to install pumps in the FED wells and bore 400 wells in villages bypassed by the FED project. USAID contracted these aspects of the project to private companies. (USAID Project Paper, 1979, p. 17.) Four hundred wells were in place by September 1982 with improvements to 700 wells. (Morris, 1983.)

Health Education and Village Sanitation

The Ministry of Social Affairs and Sanitation assumed responsibility for the health education and village sanitation aspects of the USAID project. The Ministry had over 400 Social Affairs Agents--Agents de Promotion Sociale (APS)--scattered in the rural areas of Togo with responsibility for community development. The APSs were secondary school graduates who had received three additional years of training in all aspects of community development at l'Ecole Nationale de Formation Sociale. The agents worked in teams of three, one responsible for community development, another for health education, and the third for the development of women. Each team was responsible for several villages. They worked in close collaboration with all other Government services, such as health, education, and rural development. (USAID Project Paper, 1979.)

A 1981 agreement between Peace Corps and the Ministry of Social Affairs involved at least 10 Volunteers, each to work with one subregional APS team. Teams of Social Affairs Agents and PCVs organized villages to accept responsibility for maintaining the well pump. In addition, the teams organized health/sanitation campaigns, and assisted in planning and implementing small-scale community health projects including latrines, cisterns, and gardens. Three micro-projects were financed per village. (CMP FY1983.) Villagers contributed local materials, labor, and money for the execution of the micro-projects. The Project provided imported materials and tools. (Morris, 1983.) Health education sessions were devoted to pump maintenance and repair, and using safe water for health, hygiene, and disease prevention.

The USAID project design team included an anthropologist who interviewed the women to see what they would do with their time when they were freed from fetching water. Most indicated their intention to spend the time in farm work or crafts; they were eager to earn more money for personal and family needs.

APS efforts were complemented by health education in the primary school classrooms covering oral rehydration therapy, guinea worm prevention, and literacy. The Village Health Committee coordinated all village-level activities.

Training for the first Volunteers was designed to prepare B.A. generalists to train village-level personnel, especially women, in tropical disease prevention techniques. Volunteers were also trained in how to use health education methods, supervise team activities, determine problems and establish a problem solving network, and work out the logistics of installing sanitary facilities. (Traub, 1981, p. 1.)

The training program was divided into two phases. Phase one consisted of six weeks in Gallup, New Mexico, where Volunteers learned about their role in development and were trained in construction, water systems, waste disposal, and health education. The second phase consisted of six weeks in Togo, where Volunteers learned about water-related diseases, oral rehydration, village health committees, field surveys, Togolese institutions, and working with counterparts. The six weeks of training in Togo included language and cross-cultural training. (Traub, 1981, p. 2.)

The APCD/RD with responsibility for this group commended the results of the training and acknowledged the Volunteers' improved level of motivation, sensitivity to cross-cultural issues, and grasp of basic technical information. However, the APCD/RD suggested that future training be held completely incountry for the following reasons: (a) the Stateside Training was designed to prepare PCVs for actual field construction of latrines, water systems, etc., whereas the work in Togo involved more community development and supervision of field agents; (b) the time spent in New Mexico foreshortened the time that could be spent on French, a primary skill; and (c) what was learned in health education and sanitation practices had to be redone in French. (Phillips, 1981.)

By the time the second group of six Volunteers arrived in 1982 (bringing the total to 11), wells had been drilled in 250 villages; 300 Village Health Committees had been formed and were functioning; and 190 Village Health Committee members were trained in principles of bookkeeping, organization of meetings, and pump maintenance and repair. Baseline data had been collected on 28 villages covering current medical practices; hygiene; nutrition; health knowledge, attitudes, and practices; and water utilization. (CMP FY1982.) The new group was to establish and train 200 village health committees, undertake 175 secondary health/sanitation projects, design a health education campaign, and begin village contacts in another region.

Given the success of the initial groups in the health/sanitation and community development aspects of the project, new Volunteers with specific technical skills have been requested to help with the micro-projects. Volunteers have also been requested to work in the Plateaux Region in 1984 in villages where well-drilling was unsuccessful. They are to work on spring-capping and on piping systems. (Morris, 1983.)

HEALTH

In the early 1970s, Togo's health infrastructure was well established but lacked trained manpower and funds. Peace Corps/Togo's health programming aimed at meeting these manpower needs with skill-trained Volunteers.

Peace Corps/Togo's five-year plan in health for that period called for provision of personnel for the Health Education Department; the renovation and equipping of 50 dispensaries, including the provision of clean water supplies and elementary sanitary facilities; and arresting communicable and infectious diseases through surveys and vaccination programs, particularly for tuberculosis, whooping cough, measles, yellow fever, and onchocerciasis. (CMP FY1970-73.)

Health Education Project (1969-78)

Collaborating Agencies: Peace Corps, Ministry of Health, WHO

From 1969 to 1976, Peace Corps' Health Education Project fielded 80 trained Volunteers as Health Educators working for both the Health and Education Ministries. These Volunteers promoted preventive measures as a complement to the curative medicine already practiced in Togolese hospitals and dispensaries, by introducing health education into the schools and dispensaries. They worked with schoolteachers, nurses, midwives, sanitation agents, and social workers in giving lessons and by practical application of the lessons in construction of latrines, wells, and cisterns. (CMP FY1977, p. 12.)

Major accomplishments of this project were the production of health education texts and numerous visual aids, some of which were incorporated into the official national schools curriculum and widely disseminated (School Hygiene Manual/Manuel d'Hygiene Scolaire, a teacher's resource book, two teacher manuals on sanitary education for grades 3-4 and 5-6, Fiches d'Education Sanitaire, and Health Advice for the African Family, Conseils de Sante a la Famille Africaine). Conseils de Sante is used in village clinics for giving basic family health lessons to women who have come in to give birth or for pre- or post-natal checkups. (It is widely distributed in Francophone Africa through ICE and has been translated and adapted for Anglophone Africa as well.)

In 1973-74, four Volunteers conducted a survey of those afflicted with onchocerciasis for the Department of Endemic Diseases. The Volunteers traveled throughout Togo taking skin snips for analysis to determine disease prevalance and geographical distribution. As a direct result of this year-long Peace Corps project, Togo participated actively in a massive West African "river blindness" campaign sponsored by the World Health Organization. (CMP FY1977, p. 2.)

Despite these accomplishments, only six of 18 trainees remained in the project in 1975. The Volunteers felt the major goals and objectives of the project had been achieved even before they began service, that Togolese personnel then in service were competent to teach health education, and that a Volunteer presence was no longer needed. The remaining six Volunteers spent their second year introducing a Peace Corps-developed sex-education manual in certain pilot primary schools and conducting sex-education workshops for school teachers. These materials were adopted by the school system on an experimental basis. Although the GOT solidly supported the promotion of sex education, public disapproval brought these efforts to a halt. No trainees were requested for 1976. (CMP FY1977, p. 13.)

Staffing problems also contributed to the decline of the Health Education Project. One reason for the Project's relative success between 1969 and 1973 was the presence of an APCD/Health who was a respected professional person with excellent relations with the Ministries of Education and Health. When she left in 1973, PC/W, in an economy move, abolished the position and gave those responsibities to the Peace Corps Medical Officer (PCMO). The Health Education Project was a low fourth in the PCMO's order of priorities, following: (1) medical care of Volunteers and staff; (2) medical care of Embassy personnel and their families; and, (3) the onchocerciasis project, which he directed.

Nonetheless, the PCMO and a PCVL (a Ph.D. candidate in Public Health) managed the program well. However, when both left Togo in 1974, a PCV without experience or professional credentials took over the leadership role in health education. From that point, relations with the Ministry of Health declined, and programming diminished. Volunteer attrition rates increased as of 1974, and by 1976 this project was ranked eighth of ten by PC/T. (Morris, 1983.)

PEACE CORPS/TOGO

Collaboration

Many Peace Corps/Togo projects are integral parts of existing government programs. Other projects depend on international agencies, non-governmental organizations (NGOs), the Peace Corps Partnership Program, and the U.S. Ambassador's Self-Help Fund for support. International agencies which provide assistance include the European Development Fund (FED), the United Nations Development Program (UNDP/PUND), and the U.S. Agency for International Development (USAID).

Training

Peace Corps/Togo's training philosophy is "geared to clear, complete, specific program and job descriptions. . . . If a viable program and Volunteer job have not been developed by the Togolese government agency, the Peace Corps, and any third-party agency involved, then, no amount of training will suffice to prepare the trainee for a satisfying and effective volunteer service. Training must provide the future Volunteer with as realistic a conception of his potential job and living situation as possible, and must provide him with the necessary basic skills for both." (CMP FY1977, p. 14.)

The typical training program begins with intensive French language instruction. This is followed by technical training, mostly experiential; living experiences with Togolese families, actualizing the formal cross-cultural presentations; living experiences, whenever possible, with Volunteers currently in the same programs for a first-hand orientation to the job; and a structured introduction to local languages, to facilitate the Volunteer's integration into the local community.

In the FY1977 CMP, the issue of local language training was discussed. In studying the files of early Rural Development projects, it was discovered that many Volunteers finished training with a score of FSI 1 or 1+ in local language and made significant progress thereafter. As the time allotted to local language training was reduced in pre-service training, this essential aspect suffered. A 1976 examination of 26 Rural Development Volunteers revealed that only a few third year PCVs had achieved a 1 or 1+ level, and most had only achieved the 0+ level or spoke no local language at all. "Peace Corps/Togo felt strongly that the decline in local language mastery had had an adverse effect on both the quality of the Volunteer experience in Togo and the quality of Volunteer service rendered to Togo." (CMP FY1977.)

To correct the situation, PC/Togo concentrated on Ewe as the language for training of Volunteers posted to southern Togo and Kabiye as the language for the northern region. (Some other local languages are still taught.) The trainee's language instruction time was divided evenly between French and a local language, once he had reached an FSI 2 in French in pre-service training.

There are materials for teaching the three most commonly used languages in Togo. To minimize language learning difficulties, all trainees except those in math/science/technical education are required to have at least two years of high school or one year of college French, or six months in a French-speaking country before they enter training so that local language can be a significant part of their training. PC/Togo pays for ongoing language lessons after the Volunteer reaches her site. Peace Corps language coordinators visit each Volunteer to help select a language teacher, prepare materials for lessons, and devise a plan to monitor Volunteer progress.

During the 1969-1976 period, job assignments and training were differentiated by sex roles. Almost all the Health Education PCVs were women who worked with primary school children and women at the dispensary. They also worked on construction of latrines, wells, and cisterns; however, they received no hands-on training in construction. They taught nutrition but were not trained in gardening or small animal-raising. Male construction Volunteers, on the other hand, were given hands-on training constructing wells, cisterns, schools, and bridges.

To address these issues, from 1976 to the present, PC/T has steadily integrated training activities for construction, water/sanitation, and health education Volunteers. (Morris, 1983.)

At present, pre-service training uses the village-based training model for projects that involve rural-based activities. ISTs focus on team-building, providing and/or upgrading PCV technical skills, and introducing new skills in areas of possible secondary project activities. Today's emphasis (FY1984 CMP) on secondary projects in subsector areas promotes a more integrated PC/Togo country program. "Cross-cutting program development skills help Volunteers to appreciate the interrelatedness of their separate primary activities and promote their perception of development as an integrated set of interventions and changes in a wide range of social, cultural, and economic spheres." (CMP FY1984, p. 92.)

Women in Development

Togolese women make up the majority of those who attend the health/sanitation meetings in the villages where Volunteers conduct health/sanitation campaigns. The wells projects not only relieve women of the burden of walking long distances to fetch water, but also provide means to improve the health of the women and their families and enhance their ability to organize income-generating activities.

In 1981, PC/Togo started discussions with the Status of Women (Condition Feminine) Division of the Ministry of Health and Social Welfare to identify how the Wells/Sanitation Volunteers could help local women. (CMP FY1984, p. 91.)

ANALYSIS*

The Peace Corps programs related to water and sanitation evolved in Togo over the years. Initial problems arose due to a lack of comprehensive planning both on the part of the government of Togo and Peace Corps, partly because of the number of government agencies involved. Once responsibilities were consolidated, programs were able to move forward.

Aspects Contributing to Project Successes

- Volunteers were initially posted in small numbers until the programs proved to be worthwhile and well-supported.
- The Volunteers assigned tasks within the water, sanitation, and health education sectors were all posted at the local level, addressing needs identified by the village leadership.
- A transfer of knowledge from the experience gained during implementation of the wells programs throughout West Africa was shared in a Peace Corps conference held in Togo. Common problems and their possible solutions as well as alternative technical methods for well construction were highlighted.
- Village contracts were drawn up prior to the implementation of wells and latrines projects to assure the full participation of the beneficiaries.
- The focus in Togo was gradually shifted from an urban concentration in the water and sanitation sectors to a well-mixed program addressing rural populations as well as urban. Peace Corps programs were a significant catalyst affecting this shift.
- A National Water Commission was eventually created in order to coordinate all of the activities in this sector.
- One of PC/T's greater successes has been its dedication to documenting its work and developing manuals, handbooks, plans, and visual aids adapted to Togolese use. In addition to the health education books, PC/T has produced an agricultural education handbook, Manuel de Project Agricoles Scolaires. (Morris, 1983.)
- Peace Corps was able to coordinate with USAID in implementing a project which constructed wells and, at the same time, integrated health education and village sanitation aspects into the project design.
- Togolese counterparts were assigned to work with Volunteers to build the local capacity to replicate such projects.

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*By Joseph Gadek and Diana Talbert.

- Health education and village sanitation aspects of the extension programs were designed to accommodate women's needs more fully, because water and sanitation issues directly affected women more than men.

- A village contribution of labor and local materials was normally requested to reduce costs and indicate the priority of the project within the village.

- Village committees were formed where Volunteers worked to assure that there was a mechanism for information transfer and that villagers supported the agreed-upon course of action related to water and sanitation.

- A maintenance training aspect was added to the water supply programs to enable the villagers to address breakdown problems.

- The Volunteers' language skills in French and other local languages contributed to their working effectiveness in the rural areas of Togo.

Aspects Hindering Project Successes

- Initially, the roles of Volunteers were not well-planned in the rural water supply sector; however, since only three Volunteers were initially placed, they were able to develop the program as time went on.

- There were several ministries which were working in the sector of rural water supply (mainly wells), but little or no coordination among them in the early stages. The more parties involved in projects, the more complicated the timing of Volunteer recruitment and the more staff workload for all parties in planning and liaison.

- The aspect of local village training of manpower for maintenance of handpumps was overlooked for a long period. This aspect was eventually incorporated into the overall project, as it was recognized as fundamental to a successful project.

- Originally the role of Togolese counterparts was not emphasized. Consequently the self-help capacity building element of these water supply and sanitation projects was weak. This was eventually reversed.

- Initially the roles of women in these projects were not fully recognized and addressed. The success of many aspects of these projects rested upon local women's inputs, particularly related to health and household sanitation, but their involvement was not solicited.

PROGRAMMING GUIDELINES

SIGNIFICANT FACTORS IN SUCCESS OR FAILURE OF PEACE CORPS ACTIVITIES IN WATER AND SANITATION

PROGRAMMING FACTORS

Priority for Water and Sanitation Problems/Programs by Host Country
Existing Physical/Environmental Setting
Existing Institutional Structure Responsible for Water and Sanitation Programs
Integrated Development Programming Approach
Community Participation in Proposed Program Design
Training Component of Proposed Program
Cross-Sectoral Considerations
Type of Technology Required under Proposed Program
Peace Corps Staff Capability to Design Feasible Programs
Peace Corps Staff Supervision and Support of Proposed Programs
Qualifications and Numbers of Required Volunteers
Development of a Schedule
Budgetary Constraints

RECRUITMENT FACTORS

Portrayal of Volunteers' Work and Social Setting
Expectations of Host Government
Recruitment of Professional/Specialized or Generalist Volunteers
Women in Water and Sanitation Programs
Single Versus Married Volunteers
Timing

TRAINING FACTORS

Task Analysis to Determine Training Objectives
Technical Training: In-country or Outside
Languages Required for Effective Field Work
Cross-Cultural Training

SUPPORT FACTORS

Peace Corps Staff Support
Host Country Support
Community Support
Peer Support

SIGNIFICANT FACTORS IN SUCCESS OR FAILURE OF PEACE CORPS ACTIVITIES IN WATER AND SANITATION*

Lessons learned from the Thailand, Yemen, Paraguay, Sierra Leone, and Togo case studies indicate that a number of common factors contribute to the success or failure of Peace Corps activities. They may be useful as guidelines to improve existing projects or plan new ones.

PROGRAMMING FACTORS

Priority for Water and Sanitation Problems/Programs by Host Country

With few exceptions, no Peace Corps initiative in the water and sanitation sector is successful in the long term if the host country itself does not consider such programs of high priority in their own budgets and in allocation of manpower to work in these sectors. Peace Corps programs do well when coinciding with the host country's five year development plan priorities. Suggestions of new programs or new approaches in addressing local development issues in the water and sanitation sectors are appropriate. Countrywide or regional surveys of existing situations and needs provide a good starting point.

It is always helpful to review the host country budget allocations to the water and sanitation sectors, including related areas such as health education and rural development, to see what degree of importance they have. If sectors with water or sanitation activities are not rated highly in budget allocations, perhaps a shortage of manpower resources to initiate and sustain programs is the reason. If there is a recognized need for water/sanitation projects, but insufficient funds or manpower, there is potential for outside financial assistance combined with Peace Corps human resources in programming for this sector.

Existing Physical/Environmental Setting

The topography and environmental setting of the country require consideration in programming a new project in the water and sanitation sectors. The basic parameters to be included in consideration are:

- size of country and size of proposed project area;
- accessibility (transportation for personnel and materials) to project area or the lack of it;

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*by Joseph A. Gadek

- rainfall pattern in project area, i.e., arid, semi-arid, or rich in water resources;
- topographical details, a factor in considering gravity flow potable water supply programs;
- hydrogeological (groundwater) conditions in project area--are villages in the project area currently using wells as their water source; are there associated problems such as salinity or seasonal fluctuations in water level;
- quality rating for the present source of local water supply;
- general health of the population in the project area: which water-borne diseases are common;
- the traditional means of excreta disposal used in the project area, e.g., latrines, septic tanks, bush; and
- sociocultural considerations; e.g., who carries the water, who decides what and where the new water source will be, who implements the project, who is affected by the new water or sanitation system and how.

These parameters are not all-inclusive and each individual case may have others specifically pertaining to its design. These should all be well thought out in considering each program case. The more information gathered about the potential project area in advance, the more flexibility in designing and implementing an appropriate solution to the problem. Specific site selection is also critical to Volunteer success and satisfaction.

Existing Institutional Structure Responsible for Water and Sanitation Programs

Consideration must be given in programming for a water and/or sanitation project as to which ministries will be involved in planning, implementation, and administration. In many cases it will be observed that no single ministry has the institutional/managerial responsibility for water and/or sanitation programs. Water, sanitation, and health education may all fall under different ministries in a rural development program, which is a viable institutional arrangement as long as ministry, Peace Corps, community, and third party responsibilities are clearly defined. Contracts or signed agreements are recommended at all levels.

A common situation experienced in many countries is to have more than one ministry constructing wells or latrines in rural areas. In a situation such as this, the program process by Peace Corps staff may include participation in interministerial meetings or coordinating committees.

Integrated Development Programming Approach

As a rule, no water supply project should be programmed by Peace Corps without at least considering excreta disposal and health education at the same time. Water supply programs should not be viewed in a narrow fashion as too often has been done in the past. The approach of integrating health education, community participation, counterpart training, and maintenance-oriented village level training components with water supply and sanitation programs is much more effective in developing long-term, sustainable results.

This approach, however, is more difficult to orchestrate from a managerial standpoint, since interministerial coordination is often required. The success of the overall program depends heavily on how well this coordination is managed. The isolated water supply component, however, may be carried out successfully, thus keeping Volunteers content in the field, while issues of overall coordination are still being resolved.

Short-term, tangible results are important in keeping Volunteer and community motivation high. Programming and placement of Volunteers in the field for water and sanitation programs, however, should always be done with the long-term results in mind. If 300 wells are successfully dug and capped with handpumps to provide for better water quality and in two years' time only 30 percent of them are functioning because of lack of training and no spare parts, it would be hard to judge the overall effort as successful. The total long-term result has to be projected in designing these programs initially.

Community Participation in Proposed Program Design

Any water or sanitation program to be undertaken with Peace Corps technical assistance should strongly emphasize local community participation from the initial programming/negotiation stages of project design through implementation and maintenance training. Without village level support of these activities, the eventual long-term "success" of the program will be dubious. If the host country is identifying water and sanitation programs which are conceptualized from the top down--i.e., with little or no village level participation in problem identification and project design--the projects may fail due to lack of local motivation and ownership. Working through the responsible ministry, community involvement can be assured by means of an institutional arrangement whereby the village leadership and ministry representatives sign a contract defining responsibilities, resources, labor, and material supplies.

Training Component of Proposed Program

As previously mentioned in the section "Integrated Development Programming Approach," the training of local people to take over after Volunteers depart is an essential component of any water or sanitation effort. Past histories of project failure very often show this element as that which was missing from the original design. If an outside construction contractor is brought into a village to construct ten wells and does so without imparting any training to the beneficiaries in the areas of maintenance skills and health practices, a short-term benefit may be seen by the community, but in the long term this program would probably be deemed unsuccessful. Handpumps break down and eventually the well becomes contaminated as a result of the lack of training and education components in the program.

"Training" has two organizational components and each component should be addressed in programming for water and sanitation efforts. The training of counterparts to eventually fill manpower needs initially met by outside assistance is one component of training required; the second is the training required at the individual project sites to enable local villagers to maintain and sustain their own projects.

The training of counterparts to allow for the eventual "localization" of a project accomplishes Peace Corps' Forward Plan goal of a multiplier effect. Properly trained counterparts can replicate similar water and sanitation programs and train more counterparts to broaden the national capability to undertake more such programs.

On the community level, the training is primarily aimed at enabling the villagers to understand and maintain what has been developed. This may also act as a multiplier effect; for example, through village participation during well or latrine construction and ancillary training, the capability can be created of constructing more wells and latrines if the need and motivation are present.

Cross-Sectoral Considerations

The water and sanitation sector is not exclusively centered upon potable water supplies and latrines. As previously pointed out, health education must be integrated into all potable water and environmental sanitation programs if lasting effects are to be achieved. There are many other program areas in which Peace Corps participates around the world which involve water and sanitation activities. These are worth reviewing so that sectorally oriented programs do not develop too narrowly.

- Health. This is the most significant cross-sectoral link to water and sanitation programs. In terms of programming requirements, the health education inputs are the most significant factors related to water and sanitation concerns.

- Agriculture. Almost all of the countries where Peace Corps is involved in development programs are agriculturally based and the water and sanitation sector is integral to agriculture in the area of irrigation. The health and nutrition of farmers and their families are affected directly by irrigation systems. Irrigation programming, therefore, should be coordinated with agricultural, water and sanitation, and health sector components.

- Energy Programs. In recent years, Peace Corps has given substantial attention to renewable energy programs throughout the world. A few examples of the cross-sectoral links between the water and sanitation and energy sectors within Peace Corps are handpumps, hydraulic ram applications, methane gas generation from waste matter, mini-hydropower generation, and windmills for pumping water.

- Forestry and Soil Conservation. In viewing the broader issues of water resource management, forestry and soil conservation programs are integral components. Watershed management programs to increase agricultural productivity, generate hydroelectricity, and generally make more efficient use of water as a precious resource are "rooted" in forestry and soil conservation efforts.

Type of Technology Required under Proposed Program

In attempting to have the "greatest multiplier effect" as outlined in the Forward Plan, programming for the water and sanitation sector continues to emphasize the more appropriate types of technologies and the utilization of local resources. It should be emphasized to prospective Volunteers that Peace Corps' philosophy in the water and sanitation sector is to concentrate on projects which can make use of appropriate technology for development rather than those which require "high technology" solutions. Clear job descriptions help to avoid false expectations on the Volunteers' part by firmly stating this overall sector philosophy at the outset.

Peace Corps Staff Capability to Design Feasible Programs

Peace Corps staff members incountry can draw on a number of sources of information, technical assistance, and training to support their efforts in water/sanitation programming:

(a) incountry personnel in the appropriate ministry, the USAID mission, or other donor agency office;

(b) the Peace Corps Water/Sanitation Sector Specialist in Washington;

(c) the Peace Corps Programming System Handbook including guidelines for project planning (see pages 283-314 of this document);

(d) the Water and Sanitation for Health (WASH) Project, funded by USAID to provide general technical assistance, technology transfer, human resource development and training, and technical and development information to improve drinking water and sanitation projects with a minimum of administrative effort and delay (write to WASH through the USAID office incountry or at: WASH, 1611 North Kent Street, Room 1002, Arlington, Virginia, 22209, U.S.A.);

(e) Peace Corps' Information Collection and Exchange (ICE) for technical information.

Peace Corps Staff Supervision and Support of Proposed Programs

In proposing any new water and sanitation programs, the Peace Corps programmer must consider the level of projected staff, Volunteer, and equipment support as well as community, ministerial, and third party collaboration required for actual implementation and determine if existing levels are adequate. Should there be a projected shoftfall in support at any level, then an increase must be planned and budgeted for in order to make for a successful program.

The Volunteer to staff ratio is a major programming consideration. Setting up new programs is a long, involved, time-consuming process. If the Volunteer to staff ratio is higher than 40 to 1, the best a programmer can do is maintain and refine existing programs. The ratio must be at most 25 to 1 for programming initiatives to take place.

Qualifications and Numbers of Required Volunteers

The required qualifications for Volunteers in the proposed program should be clearly and accurately portrayed in the initial programming task. If the requirements are overstated, frustration and job dissatisfaction will result, threatening the success of the program. Likewise, if the qualification description is understated and Volunteers are recruited into positions over their level of capability, they will not be happy and neither will the host country. Usually, however, from experience, overstating the required qualifications is the more common error in programming.

Peace Corps experience has demonstrated that more often than not, generalists are more satisfied Volunteers than professionals. The generalists enjoy the challenge, their expectations are open, they are better listeners, and they are usually more tolerant of submersion in another culture. However, skill-trained, generalist Volunteers must make an extra effort to earn the respect of their communities, counterparts, and host government.

There are roles for professionally qualified Volunteers and many serve successfully, but Peace Corps efforts to reach the poor frequently determine a setting which is most appropriate for community development generalists.

Projecting the required numbers of Volunteers to be recruited also must be well thought out. Caution must be used in the start-up of a new program so as not to overload the Peace Corps support and supervision staff or the local ministry directing the program. The absorptive capacity of the local ministry may be such that a few Volunteers should be brought over initially to make a pilot run of the program. Volunteer numbers can be increased as institutional and management systems develop and demonstrate the ability to provide adequate support.

Development of a Schedule

At the same time, programmers must plan realistic time frames for getting the water and sanitation program under way once it has been conceptualized and designed. Peace Corps staff must be cautious in making premature commitments of Volunteer placements. Approval, funding, recruitment, staffing, procurement, etc., all take time and all of these elements need to be considered in terms of timing and their effect on the program's implementation.

A common problem in timing relates to third party donor involvement with a water and sanitation program, usually involvement in funding and/or management. Volunteers have been recruited and trained, only to find that the third party arrangements have been delayed or cancelled. This leaves a newly-trained group of Volunteers to be reprogrammed; often they terminate because of the frustration of underemployment. There are never guarantees against this event, but the possibility needs to be considered and contingency plans arranged. Initial Volunteer requests should be kept minimal until most of the program uncertainties are resolved.

Budgetary Constraints

Programming Volunteers into existing externally-funded projects often provides a well-funded and administered structure. In any case, budgetary considerations should be clarified early in the programming process. Some items of significant cost which often appear in water and sanitation programs include transportation capital cost (vehicle or motorbike); imported parts; ongoing transportation, operation, and maintenance costs; construction equipment and materials; incountry training materials; technical resource materials (books, tools, instruments, etc.); in-service workshops/seminars as refresher courses and experience sharing opportunities; and work-study tours.

RECRUITMENT FACTORS

Portrayal of Volunteers' Work and Social Setting

In filling positions for the water and sanitation sector of Peace Corps, it is extremely important that the job description from the field to the recruitment office in Washington reflect appropriate skills required. During the programming phase of developing projects, the recruitment office or the water/sanitation sector specialist can be contacted for advice on technical skills and recruitment availability.

By providing an accurate portrayal of the Volunteers' work program and living situation, an appreciable amount of Volunteer frustration and attrition can be avoided. If living conditions are to be difficult, this must be honestly stated. Recruitment of an engineer or similarly trained Volunteer who anticipates filling a technically challenging role in the Peace Corps, only to find her role to be oriented primarily toward community organization, will only create a chain reaction of dissatisfaction.

Expectations of Host Government

In many cases, the host country ministry will request engineers for positions which may not actually require an engineer. They may not have confidence in a generalist Volunteer who is "only" skill-trained by Peace Corps.

Often, if the host country requests engineers to fill an entire program in rural water or sanitation and the Peace Corps staff representative feels that this is inappropriate, a workable alternative is to provide a certain ratio of engineers or technicians to generalists. Using a team approach, the engineers can act as advisors to the generalists and the needs of all parties are met.

Recruitment of Professional/Specialized and Generalist Volunteers

As mentioned in the preceding sections, care must be taken in the qualifications specified for Volunteers to fill the proposed program. With the Peace Corps' general policies of working at the local level, high technology positions are the exception rather than the rule. Professionals should be advised that most positions available in the water and sanitation sector involve planning, management, and community organization, as well as technical skills. Certainly, good working experience can be gained, but the Volunteer being recruited must be aware that the work is usually very much a multifaceted job which requires patience, cultural understanding, and flexibility.

In requesting specialists or generalists who can be skill trained, it should be kept in mind that specialists are more difficult to recruit and the process takes much longer. Initially, when programming Volunteer roles, communication with the recruitment and placement personnel in Washington and/or the water and sanitation sector specialist will indicate to the Peace Corps programmer in the field what numbers he can realistically expect to recruit.

Women in Water and Sanitation Programs

As Volunteers and staff have discovered in working in the water and sanitation sector in developing countries, the primary beneficiaries of such programs are women and children. Women and children are the main "drawers of water" and their health and productive time are directly affected by water and sanitation programs. In many cultures, it may be easier for a female Volunteer to gain the trust of the local women. This is important for the following reasons.

- Local women should be consulted initially concerning the design concepts of the program: social ramifications, cultural beliefs and taboos, and physical considerations affect project success.

- Women often are the primary workers during implementation of the project under self-help schemes.

- In developing and transferring the "software" aspects of health education to the community, women will be the primary recipients.

- With operation and maintenance of water and sanitation systems a very important issue and, up until now, one for which an easy solution has not been found, women from the community should more often be offered some maintenance training, since they are the primary users of the hardware.

In light of this, women need to be recruited more actively for water and sanitation programs. Lessons learned in the field demonstrate that the primary shortcomings of projects are related to the neglect of health education and training for operation and maintenance of constructed water and/or sanitation systems. Innovations for the future depend very heavily upon well-designed projects which address these issues and consequently should rely more heavily upon the input of female Volunteers.

Single Versus Married Volunteers

This is an aspect of Volunteer recruitment which needs to be stipulated case by case. When Volunteers are to be assigned to a job that requires moving frequently, it is often advisable to request a single Volunteer. (An example of this situation would be a well driller living out of a tent.) Consideration should be given to the accessibility of the post and the local culture. Spouse combinations of water technician and health educator have been very successful.

Timing

Poor timing in the recruitment phase of a Peace Corps program can get the Volunteers and projects off to a bad start. Some typical elements of recruitment timing to be considered are:

- established training cycles;

- work season, i.e., if there is a rainy season, the recruitment should be timed so that completion of training is the dry season;

- full availability of PC staff support when trainees arrive in country; and

- funding actually established and all project documents signed.

TRAINING FACTORS

Task Analysis to Determine Training Objectives

Clear training objectives are determined by the Volunteer task analysis performed during project planning. (See Project Planning, Appendix F.)

Technical Training: Incountry or Outside

Whether technical training should be conducted in the host country or outside is a program-specific decision. Generally speaking, training should be conducted incountry whenever possible in order for trainees to learn local working conditions, institutional roles, and country-specific problems which will be encountered during actual implementation; for host country nationals to participate in the training whenever possible; and for Volunteers to get a firm base in language and cross-cultural skills.

In some cases where the technology is new or unproven in the program, training outside the country may be more prudent. The Peace Corps water and sanitation sector specialist will be able to advise field staff as to what training options have been used in the past and what might be feasible for future training programs.

Languages Required for Effective Field Work

In planning the training for water and sanitation Volunteers, language training must be considered in light of the proposed postings. For effective work relationships, particularly in rural areas, the Volunteers' local language skills should be good. In many cases, there may be one official language and a local language required for communication with villagers. This can only be planned for in training programs if the Peace Corps staff member responsible for the designated program is aware of the posting locations before training begins.

Cross-Cultural Training

Cross-cultural orientation is a standard component for Peace Corps training programs, especially since most water and sanitation program Volunteers will be living in rural areas. This is another reason why, when possible, the technical training should be conducted incountry. The more time a trainee spends in the country under the supervision of someone experienced in that culture, the more she will learn from observation and example.

SUPPORT FACTORS

Peace Corps Staff Support

In planning and programming for a water and sanitation project, effective Peace Corps staff supervision is essential. Time is needed to troubleshoot problems in the existing program, to find ways of expanding good programs, and to develop new programs. A Volunteer to staff ratio of 25 to 1 is recommended for optimum effectiveness. The maximum should be 40 to 1, a level which will allow for maintenance of existing programs only.

Included within Peace Corps staff support are technical advice, site visits, in-service workshops, and in some cases material support (transportation, tools, per diem). These issues of support need to be agreed upon in developing the program so that the host country, Peace Corps, and any third or fourth parties understand what is to be supplied by whom.

Clear job descriptions and definitions of goals should be set out for both Volunteers and Peace Corps programmers. Clear communication of expectations is an integral part of successful Peace Corps programs.

Host Country Support

As mentioned earlier, unless the host country, at both ministerial and community levels, is committed to the water and sanitation program, it is very unlikely that any long-term benefits will result from that program. Host country support of Volunteers must be closely monitored by the Peace Corps staff involved. Typical support components which the host countries have contributed to past water and sanitation programs include housing, transportation, fuel, counterparts, tools, labor, and construction materials.

Community Support

The support of the local community where the project is being implemented is the key element in the Peace Corps development process. A Volunteer can go into a community and personally construct ten wells in two years, which will be a service to the community, but not help in its overall development.

Community support is essential for the more difficult issues of health education and maintenance training. Volunteers need training, support, and advice in nurturing local community support. Volunteer impatience, "western" thinking, and unfamiliarity with local institutional processes have led to incomplete and unsatisfying projects. Signed agreements between communities and contractors solve some of these problems.

Peer Support

Periodic work-related seminars should be convened during the water and sanitation program's working life. Such conferences assist all involved (Peace Corps and host country) by sharing common problems and solutions associated with technical, cultural, community participation, and health education/training issues. Volunteer morale can be effectively boosted with an occasional conference. In remote regions, Volunteer postings should be within a reasonable distance of each other so that occasional meetings for peer support can occur.

Additional detailed information on project planning can be found in Appendix F.

TRAINING

INTRODUCTION

Until 1979, the training of Volunteers for water and sanitation projects had been designed primarily by Peace Corps field staff and contracted out or implemented directly by them. The technical training in most countries ranged from a two- to four-week on-the-job "orientation" to limited skill training as a part of a 10- to 12-week total pre-service training. Health education and community participation training was usually not integrated with the technical training. Water and sanitation tended to be treated as very separate, discrete projects and areas of concern. (The Peace Corps' Water and Sanitation Sector, March 1981, P. 3.)

In 1979, the sector staff in Washington outlined a set of training goals which included the development of a combined water/sanitation skill training model for generalist Volunteers, and the refinement of a set of training objectives which integrated health education and community participation with technical subjects. The unit also contributed to increased sharing, among countries and with headquarters, of ideas, methods of training, and qualified potential trainers.

Following an investigation of past training programs and contractors, it became apparent that a need existed; there was a limited number of qualified technical trainers in water and sanitation who had Third World experience, were familiar with and could transfer skills at the appropriate level of technology, and had the ability to integrate health education and community participation into the technical training. However, two organizations, the U.S. Centers for Disease Control (CDC) and the U.S. Indian Health Service (IHS), which had at times been involved in Peace Corps training over the years, employed potential trainer candidates and possessed materials and resources which were appropriate for Peace Corps projects.

Following two pilot pre-service training programs held during the summer of 1980, a formal "memorandum of agreement" between Peace Corps and IHS was established. The agreement calls for the IHS to provide trainers and to contract for the administration of up to five Peace Corps pre-service training programs and up to five in-service training programs per year, in the United States or overseas. The Peace Corps has agreed to provide up to three staff training workshops per year for potential IHS trainers. The first staff training workshop and pre-service training program were held in February and March 1981.

In 1982-83, using technical assistance provided by the Water and Sanitation for Health (WASH) Project, under a contract with the Water and Sanitation Division of the Health Office of AID's Bureau for Science and Technology (AID/S&T/HEA/WS), the Water and Sanitation Sector Specialist (OTPS) had four in-service workshops and trainer's guides developed in latrine construction, rainwater catchment systems, spring capping, and handpump installation and maintenance. These workshops and/or trainer's guides are available by request through the local USAID mission or the Peace Corps Water/Sanitation Sector Specialist. The training workshops can be tailored for country/region situations.

The OTPS Water/Sanitation Sector Specialist can provide APCDs and Program Managers with training assistance, ranging from information on scheduled training cycles in the United States or how a region procures assistance from WASH or IHS to personal field visits or hiring of consultants.

Following are the skill objectives, technical skills taught, and workshop descriptions for Peace Corps training in water/sanitation.

PEACE CORPS WATER/SANITATION SKILL TRAINING OBJECTIVES*

The skill training program for water and sanitation Volunteers will include components on: the role of the Volunteer in development; construction skills; waste disposal; and health education. It is anticipated that this training will take approximately six weeks. At the completion of the program the Peace Corps trainees will be able to perform the following tasks.

The Role of the Volunteer in Development

- Analyze the processes that take place in communities in reaching decisions regarding water and sanitation projects.
- Demonstrate effective interviewing techniques and data gathering methods using local resources for implementing a community sanitation survey.
- Demonstrate an ability to listen and work effectively as a helper and consultant to individuals and groups desiring assistance.
- Demonstrate a proficiency in conducting meetings using participatory meeting techniques.
- Articulate his/her strengths and weaknesses in working with other people and demonstrate a capacity to alter behavior that hinders interaction and communication with others.
- Articulate the causes and consequences of poverty and the role of self-determination and empowerment in overcoming poverty.
- Describe and demonstrate strategies for involving women in the planning, implementing, operating, and maintaining of water and sanitation projects.
- Demonstrate an ability to define problems, set goals, develop strategies for alternative solutions, organize action plans, and establish methods for measuring results of water and sanitation projects.

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*Provided by Water/Sanitation Sector Specialist (OTPS).

Construction

- Select and use the correct mix of aggregate, water, and cement for grouting and pouring concrete.
- Select and use appropriate reinforcing materials and locally available forming materials to form and pour concrete.
- Construct a concrete spring box, well slab, and latrine slab.
- Construct a framed superstructure for a pit privy (using the V.I.P. or R.O.E.C. design).

Water Systems

Source

- Determine the present water use patterns and demands using community information gathering techniques.
- Locate a source of water that meets the following criteria:
    - acceptable to the community--describe five social and cultural factors which influence a community's choice;
    - sufficient quantity from the community's perspective;
    - adequate quality.
- Springs:
    - Using community, geographical, and topical factors, select a suitable spring site in collaboration with community leaders.
    - Determine type of spring (gravity or artesian; seepage; tubular or fissure).
    - Determine if water quantity is sufficient for the community by using the appropriate community information gathering techniques.
    - Design and conduct a health education dialogue on the need to protect a spring source and how to do it.
    - Discuss potential social or cultural factors which could reduce the impact of such a health lesson.
    - Determine potential sources of pollution and feasible ways to protect the spring.
    - Determine economic and logistical feasibility of developing the spring and its distribution system.

  - Design a proper spring box and infiltration gallery system.
  - Prepare a list of materials, basic specifications, and estimates of construction cost.
  - Form and pour a concrete spring box with discharge and overflow pipe.
  - Construct an infiltration gallery to capture and direct water into the spring box.
  - Protect the spring box and infiltration gallery from potential sources of pollution.

- Wells:
  - Using knowledge of community, hydrology, and topography, select a suitable well site in collaboration with community leaders.
  - Determine potential sources of pollution and ways to protect the well.
  - Design and construct a health education dialogue with villagers on the need to protect a well.
  - Determine economic and logistical feasibility of developing the well and its distribution system.
  - Determine the type of well (dug, bored, driven) and the method of retrieving water (manual, handpump, or power-driven pump).
  - Design the well, showing all major features.
  - Prepare a list of materials, basic specifications, and estimate of construction cost.
  - Construct a shallow well, complete with casing, grouting, and slab, as well as a sanitation surface structure for an open well with a simple rope and bucket.
  - Install a pumping mechanism which can be maintained by the community.
  - Design and conduct a pump maintenance lesson for potential users.

- Catchment systems:
  - Evaluate the amount of rainfall, type of house construction, available storage space, and potential for contamination.
  - Determine if catchment system is feasible.

  - Design a catchment system for a given structure, showing all major components.
  - Design and conduct a health education dialogue with villagers in why and how to protect a catchment system.

Storage

- Determine required storage volume for community, by using community information gathering techniques.
- Determine the topography, social, economic, and political factors for a site for storage.
- Design simple storage tank.

Distribution, Transmission, and Appurtenances

- Mapping/profiling:
  - Run a level loop.
  - Establish ground profile.
  - Develop a contour map.
  - Read and interpret construction drawings.
- Piping:
  - Describe the characteristics and correct uses of four major types of pipe.
  - Select the correct pipe material based on availability, hydraulic factors, and ease of construction and maintenance.
  - Size the pipe according to hydraulic factors.
  - Demonstrate correct methods of cutting and joining various types of pipes.
  - Identify and assemble the fittings and valves for four major types of pipe.

Pumps

- Describe the principles of pump operation in shallow and deep wells.
- Identify the working mechanisms of five major types of force or lift pumps: piston, reciprocating, centrifugal, jet, and hydraulic ram.

- Disassemble and reassemble a pump cylinder.

- Disassemble, repair, and reassemble the most commonly used handpump in the local community.

- Develop a plan and an educational dialogue for preventive maintenance of a handpump and power-driven pump.

Water Treatment

- Describe four major types of treatment and their purposes.

- Determine the local attitudes and value of water quality.

- Based on local conditions and water quality, select which, if any, treatment process will be required.

- Describe five reasons why boiling water is resisted by villagers and develop a possible strategy and health dialogue to overcome this resistance.

Water Systems Design

- Select sites in collaboration with community leaders for all major components of a water system.

- Discuss economic, cultural, and social factors which will influence the site selection.

- Design and sketch a water system, detailing all major components.

Waste Disposal

Latrines

- Select a site with proper protection for water supply in collaboration with community members.

- Identify five types of latrine designs. Describe their advantages and disadvantages, including sociocultural considerations.

- Construct a latrine, including pit, slab, and superstructure.

- Discuss the various cultural and social factors which can hinder or facilitate a latrine building program.

- Design and carry out a health education dialogue and program for villagers on the value of using latrines and the importance of keeping them clean.

Alternative Methods of Waste Disposal

- Discuss appropriate uses of alternative waste disposal systems.
- Design a septic tank and leachfield system.

Health Education

- Describe and differentiate the four classifications of water-related disease and the corresponding water improvement strategy.
- Describe the characteristics of the fecal-oral pathway.
- Describe the agent/host/environment relationship and the methods of control and prevention.
- Develop and describe a strategy for designing health education dialogues in a village.
- Develop and conduct an oral rehydration dialogue that children can use to teach others.
- As indicated in earlier sections, design and conduct health dialogues on:
  - -- why and how to protect a spring, well, and other water sources;
  - -- why and how to use a latrine;
  - -- why and how to protect clean water once it is taken from a source;
  - -- why and how to clean dirty water.

TECHNICAL COMPONENTS OF WATER/SANITATION SKILL TRAINING PROGRAM*

Communicable Disease

- Disease processes
- Epidemiology--epidemiological analysis: disease outbreak
- Physiology and characteristics of microbes
- Water-borne and water-related diseases
- Vector-borne and vector-related diseases
- Food sanitation principles

Water

- Ground water--hydrology
- Hydrological study of well and spring development sites
- Water sources/source development
- Water quality
- Water treatment
- Water pumping equipment
- Water development problems
- Water source development project exercise

Water Systems

- Rotary well drilling
- Cable tool well drilling
- Bored well construction
- Spring development
- Repair and installation of handpumps
- Community water system types and design considerations

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*Provided by Water/Sanitation Sector Specialist (OTPS).

- Water system design problems
- Hydraulic ram: design, operation, construction, and installation
- Design analysis: spring box and small community water system
- Soil absorption tests

Wastes

- Types, characteristics, and hazards of waste
- Waste treatment and site selection
- Water carried waste systems
- Waste construction project exercise

Latrines

- Privy design considerations
- Privy location site
- Privy construction
- Privy construction problems
- Design analysis: privy construction

Construction

- Construction skills: pipe and concrete, mapping and surveying
- Construction plans and materials

Health Education

- Preventive curative activities in a comprehensive health program
- Health education principles and techniques
- Health education design exercise

Community Organization

- Community development principles -
- Development skills exercises

Other Training Components for Water/Sanitation Volunteers

- Role of the Volunteer in development work
- Cross-cultural understanding and adaptation
- Language and communication skills

WASH TRAINING GUIDES

Four trainer guides are available from WASH. They may be obtained through the Peace Corps Water/Sanitation Sector Specialist (OTPS) or through local USAID missions. They cover four basic, low-cost rural water and sanitation technologies: latrine construction, rainwater catchment systems, spring capping, and handpump installation and maintenance. (Practical Trainer Manuals in Rural Water Supply and Sanitation: A Description for Potential Users (Draft). Water and Sanitation for Health Project, May 1983.)

These guides can be used by Peace Corps to (1) train Volunteers during pre-service or in-service training; and (2) provide Volunteers with manuals to conduct workshops themselves in water and sanitation for host country staffs or community groups which need to learn the technical skills. They are described in detail in Appendix G.

APPENDICES

SUMMARY OF PEACE CORPS WATER AND SANITATION PROJECTS

1982-1983

This is the full text of the report
on 1982-83 Water and Sanitation Projects
submitted by Dotti Andrake under contract to WASH.

October 1, 1982

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SECTION 1

OVERVIEW

The Water and Sanitation Sector of OPD has asked the AID-funded "Water and Sanitation for Health" (WASH) project to update a report of Peace Corps water and sanitation projects which was compiled in 1980. The following report updates the 1980 findings and is expanded to include collaborating agencies, related/secondary activities and project accomplishments. The standard of at least 50 percent of the volunteer's time spent in water activities was used as a basis for inclusion as a water project. All other water related activities are included under related/secondary activities.

The findings indicate not only an overall increase in water and sanitation activities but a programming strategy of integrating water and sanitation, health extension, appropriate technology, agriculture and education programs. Volunteers working in other projects are also often involved directly or indirectly with water projects as secondary activities or as part of their primary job. The introduction of new technologies in a developing country can often lead to less than satisfactory results without the accompanying education on use, maintenance and environmental considerations. A situation in which latrines are constructed above a water source has obvious contamination implications but those implications would very well go unrecognized without proper education. Peace Corps field staff and volunteers recognize the importance of integrated programming and feel strongly that sanitary and health education should be an integral part of any water project.

The fisheries programs have not been included in this report merely because it is a fairly specific programming area and the linkages to water are obvious. There are, however, specific tie-ins with water projects in several situations which should be mentioned: (1) in arid regions like Senegal the fishery volunteers work with water volunteers building irrigation systems; (2) dams and reservoirs are used as sources for fish ponds; and (3) hydraulic dams are used for household and fish pond water.

There are also many examples of volunteers who ended up working in water and sanitation projects even though their original assignments were in different areas. The following three examples illustrate ambitious, creative involvement in water projects.

A five-year Peace Corps Volunteer from Cameroon, Leanora Orr, was chosen as outstanding PCV for 1982. She became involved in water and sanitation projects while she was a TEFL teacher in Cameroon. During her volunteer years she initiated plans, solicited funding and worked on numerous water and sanitation projects including latrine construction projects in 10 primary schools, five gravity flow water systems, sanitary education and worked with a local civil engineer to upgrade existing water sources.

Gregory Tuttle and Mary Jo Wimmer were recruited as animal husbandry experts for a pig project in Swaziland. The goal of the project was the marketing of pigs in a market dominated by the South Africans. When they arrived on the site, however, there was nothing--no housing, no piggery, and no pigs. As implementation of the project stalled, Wimmer and Tuttle decided that if the piggery were ever to be successful, water (which was also missing on the site) would have to be present. The nearest source--a mountain stream--was about three kilometers away. Although they had no experience with water systems, the couple piped a gravity based system to the piggery site. Funds and consultation came from USAID but community organization and implementation were handled by Mary Jo and Greg. As the end of their tour approaches, piped water has been brought to the valley and in two animal husbandry experts have expanded their expertise into a totally new area. There are still no pigs at present.

Phebe Prescott is a Peace Corps Volunteer in Togo working on a water project in collaboration with AID, the Regional Society for Coffee and Cocoa Production and the Ministry of Rural Development. Phebe was originally in Togo working with Crossroads Africa building a youth center and was recruited by Peace Corps to work on the water project. She is presently project manager for the project which involves the construction of two small dams and a gravity feed system. This system will bring clean water to approximately 5,600 people in the village. Water will be piped to two large cisterns located on the hillside above the village and 15 faucets will be set up along the main road with faucets at both the primary and secondary schools. Villagers will have the option of piping water into their homes and paying a monthly fee. The revenue from the fees will go into a fund for maintenance of the system. There is a health/sanitation component of the project, and Phebe will be organizing seminars for sanitation education. Villages are presently using a polluted river as their water source. This gravity feed system is the first of its kind in Togo. The government anticipates duplicating the system in other locations throughout southern Togo.

The accomplishments section of this report identifies specific results of Peace Corps Volunteers working in collaboration with other development agencies to create and/or to improve the quality and availability of water resources. Through the introduction of potable water systems, there is a direct and immediate effect on health and labor by providing safe water and significantly reducing the labor cost of carrying water. These projects, especially those in which local materials and simple technologies are used, also have the potential of providing a direct small business opportunity in the marketing of these products.

SUMMARY PEACE COPRS WATER AND SANITATION PROJECTS, 1982-1983

	* COUNTRIES	* PROJECTS	PCVs AS OF 12/31/81	PCTs	PCVs & PCTs	FY83 Requests
AFRICA	16	24	217	16	233	206
INTER-AMERICA	7	8	30	17	47	58
NANEAP	13	19	103	20	123	76
TOTALS	36	51	350	53	403	340

* Countries and projects phased out or that do not have V's in water projects as primary job are not included in country and project figures.

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COUNTRY	PROJECT NAME	PCV'S AS OF 12/31/81	PCTs	TRs FY83	PROJECT DESCRIPTION	COLLABORATING AGENCIES	RELATED AND/OR SECONDARY PROJECTS
Benin	Water Sanitation	0	0	2	Still in planning stage.		School Construction V's are involved with well construction.
Botswana	Renewable Energy 637-D0	5	0	0	Project is in developmental stage. Designed to promote renewable energy technologies, esp. in the areas of domestic technology, such as cooking, water & space heating, grain milling & water pumping.	AID EDF SIDA	V's in Rural Credit Officers Prog. are involved with approving small water projects. Community Self Help Sec. School V's are involved with getting funds for & helping with the installation of wells & latrines. V's in the woodlot proj. are developing water resources for woodlots & advising on water sources.
Burundi					New Country Entry. Prog. may include; village well capping, sanitary installation, health ext. & health & water systems development.	AID	
Cameroon	Practical Training in Health Ed./ Sanitation Specialist 694-A2	11	0	0	Assist in effort to develop & implement a Health Ed. Prog. for rural poor, improve health conditions thru village committees for improved area sanitation, i.e. latrines, water storage facilities & act as trainer for health personnel. Prog. being phased out but programming potential exists in water/ environmental sanitation.	AID UNICEF Amb. Self Help	Com. Dev. V's are involved with improving water sources & promoting latrine construction.
	Water/Sanitation Technician 694-B6	0	0	8	Program in developmental stage.		
	Health Educator 694-B5	0	0	10	Program in developmental stage. (V's integrate potable water projects with other activities.)		

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		PCVs	PCTs	TRs			
C.A.R.							Health Ed. V's work with primary school teachers & directors incorporating health content into the school curriculum. This involves lessons in sanitation & potable water.
Gabon							Construction V. is working on installing wells at newly constructed primary schools. This V. will provide tech. trng. in water & sanitation to other construction V's in Gabon.
The Gambia							V's in Rural Health Ext./ Prog. are involved in water & sanitation ed., well rehabilitation, well site improvements & building latrines. 1 V.is working on a UNICEF water sanitation proj. 1 A.T. V. is designing & testing latrines.
Ghana	Community Dev./ Village Facilitator 641-A2	14	0	8	Organize labor & resources for local self-help projects which include; construction of pit latrines & earthen dams for water supply & health clinics.	CIDA Catholic Mission CRS AID	
Kenya	Water Development 615-A1	16	9	20	Construct communal water supply systems through self help approach. Assist with the design & construction of wells & latrines.	UNICEF AID	

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		PCVs	PCTs	TRs			
Lesotho	Water & Sanitation Engineer 632-B8	1	0	3	Construction of water systems, repair of existing systems & exploration of new supplies. Train local people to repair systems.	AID	Every V. is responsible for building their own latrine & informally passing on skills to villagers.
Liberia	Rural Development/ Appropriate Tech. 669-A2	22	0	12	Organize village committees & work with them for safety in the use of the water source. Construction of water seal toilets, hand dug wells & latrines.	AID EEC UNICEF UNDP CARE/Lib. Amb. Self Help	
Malawi	Rural Water Supply 614-A3	1	2	9	Installation of a major piped water proj. Siting & designing headworks, survey of main lines & route selection, siting of storage tanks, river/gully crossings, valves & flush-points. Construction of intakes, screening & sediment tanks & all other concrete works.	AID	
	Preventative Health Services/Sanitarian/ Pub. Health Lab. Technician 614-A2	10	5	7	Sanitarian: Advise villagers in the construction of simple sanitary facilities, experiment with new sanitation technologies, educate villagers in the use & maintenance of the facilities, devise workshops to teach sanitation technologies to villagers & health workers. Lab Tech: Taking samples and analysis of water, milk, and milk products, water bodies where mosquitoes and bilharzia snails breed, hookworm, meat for tapeworm, tuberculosis to determine presence of disease or infestation.	AID	

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		PCVs	PCTs	TRs			
Mali	Community Development/ Health 688-A2	8	0	6	Specific activities depend upon V's skills, needs of villagers & specific goals of the community development component which may include; simple filtration of water, rehydration techniques, wells & latrine building.	Amb. Self Help	
Niger							V's in Nutrition/Ed. Prog. are involved with teaching methods of water purification & preparation of potable water for infant formula.
Senegal	Rural Development 685-C3	43	0	37	V's act as facilitators in their villages to assess specific village needs. Activities include; kitchen & truck gardens,well digging,latrine construction,poultry raising,sm. building construction,prenatal & child care, nutrition etc. The kinds of projects are varied reflecting a diversity of needs at the village level.	Amb. Self Help CRS Baptist Mission CARITAS Dutch Emb. French Voluntaires Progres	V's in other programs have applied to Amb. Self Help Fund for assistance in funding wells, latrines etc. as secondary projects.
Sierra Leone	Rural Water Supply/ Water Supply Tech./ Health Ed. Advisor 636-A4	7	0	4	Teach villagers how to use & maintain the water sources after construction. Organize & conduct Health Ed. workshops, follow-up on water supply maintenance after construction & assist in organizing periodic inservice trainings for water project employees.	AID World Bank UNDP Fed. Rep. of Germany UNICEF	V's in other projects are involved in the construction of latrines & wells.
	Health/Community Health Worker 636-A2	16	0	25	Assist in developing a village infrastructure so that health status & environmental sanitation conditions can improve with villagers themselves as the active element in determining how the change is to occur.	Amb. Self Help	

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		PCVs	PCTs	TRs			
Swaziland	Appropriate Technology 645-B7	1	0	0	Daming of water sources & piping of clean water to school location. Use of gravity piping & installation of facets. Project was completed.	Amb. Self Help	V's from pig project built a clean water system using gravity piping & pump.
Tanzania	Rural Water Supply 621-B6	0	0	15	Programming in this area is projected for implementation in FY83. The V's will assist villages in obtaining a potable source of water.	AID	
	Schisto Control Worker 621-A6	2	0	2	A new area of programming in FY82 with plans for evaluating improvement & expansion for FY83. V's conduct surveys of bodies of water, applying molluscicide where necessary.		
Togo	Environmental/Sanitation Education 693-B0	11	0	12	V's train & supervise teams of social affairs agents to organize villages to accept responsibilities for maintenance of well pumps, organize health/sanitation campaigns & assist in construction of latrines.	AID FAC FED	Urban housing V's provide technical assistance for the construction of septic tanks. Rural Infrastructure V's construct latrines & cisterns as part of their primary jobs. TEFL, math-science, ag educ and health V's are all involved in building latrines and cisterns in schools and clinics in villages as secondary projects.
	Individual Placement 693	1	0	0	Installation in a village of aquaduct/reservoir which is a gravity flow pure water system.	AID	

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		PCVs	PCTs	TRs			
Upper Volta	Village Health/ Water Sanitation Worker 686-C3	4	0	4	Educate communities about the importance of clean water. Organize village health committees. Establish primary school health prog. Organize & make operational other programs such as latrine construction.	AID	
	Village Water Supply/ Wells Specialists 686-A2	4	0	0	Technical consultant to the well drilling teams &/or the drilled well improvement group. Train & work with village masons both in the actual digging of wells, including lining, & in planning & providing logistic support to the digging site.	AID	
Zaire	Rural Water Supply 660-A3	5	0	0	Supervise the construction of spring boxes & piped water systems. Develop training materials. (There are no future requests since V's are being reassigned from the Health project. Country is developing an integrated program of water, sanitation, health ext. & nutrition.	AID OXFAM UNDP ECZ	V's in Sec. Ed., Fisheries & Sm. Animal Hus. Programs give lessons on potable water in schools & villages.
	Community Health Project 660-A5	35	0	22	Intensive local community organization to develop a viable community health infrastructure including maternal & child health, basic sanitation, immunization & safe water supply. Training of Zairian Health workers & counterparts.	Canadian Intn'l Dev. AID WHO Catholic Dev Fund	

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		PCVs	PCTs	TRs			
Costa Rica	Individual Placement 515	1	0	0	A 3rd. yr. V. started proj. & it is now being carried on by another V. Developed a hand pump for shallow hand dug wells 3-4 ft. deep. Pumps made from local materials, simple parts & are highly durable.		
Dominican Republic	Community Water/ Sanitation Promoters 517	0	0	6	Program in developmental phase. V's will work closely with, train & help to motivate community members on water/san. projects.	AID SENASA UTOC CARE Save The Children	
Eastern Caribbean	Community Deveopment 538-11	2	2	2	Plan & design water supply systems. Simple designs for bringing pure water to sm. rural populations.	AID PAHO CADEC	
Guatemala	Potable Water 520-A1	5	10	18	Participate in the training of counterparts & technical assesors in the planification & constrction of potable water systems & in the direction & supervision of the actual construction. Orientate communities on the installation of potable water systems.	CARITAS UNEPAR	Com. Health V's are involved with Sanitation Ed. projects. 2/3's of Forestry V's are involved with educating farmers in irrigation techniques. V's in the 4-H proj. manage water resources for irrigation of sch. gardens.

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		PCVs	PCTs	TRs			
Honduras	Municipal Development/ Civil Engineer 522-A4	2	0	3	Provide technical assistance for projects chosen by the community. Responsibilities include planning, designing & supervising construction of projects such as; potable water & sevage systems & waste disposal. Maintenance & rehabilitation of water systems.	AID World Bank EEC	Pub. Health V's are involved with the promotion of latrine & water projects as part of their primary job. Some V's are involved with major proj. in Water & San. with a Health Ed. component designed to teach proper use of water & sanitary facilities & to promote their continued use once installed.
	Irrigation 522-B9	2	0	0	Work with sm. farmers to promote irrigation systems, collect & analyze water data & construct sm. water systems.		
Jamaica							V's in Health Ed. Prog. teach sanitation as part of their primary job.
Ecuador	Rural Infrastructure/ Water & Sanitation Engineer 518-A5	6	5	12	Help design & construct water & sanitary systems for rural communities.	AID CARE IEOS	V's in Rural Public Health Prog. are involved with training locals in hygiene & sanitation & the building of wells & latrines as part of their primary job.
Paraguay	Environmental Sanitation/Sanitary Inspector 526-A2	12	0	17	Development of potable water systems & sanitary waste disposal. Development of running water system, fund raising, house by house inspections of water sources, latrines & trash disposal & protection of natural springs.	AID SENASA World Bank UNICEF CRS World Food Program IDB	Rural Health Ed. & Home Ext. V's teach sanitary ed. in communities as part of their primary job. 1 V. in Forestry Ext. Prog. had well dug & pump installed for irrigation of nurseries. Health Ed. V's are involved with installation of latrine slabs. 1 V. involved with SENASA water project in preparation of wells & elevated water storage tanks.

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		PCV's	PCTs	TRs			
Fiji	Rural Community Development/Water Technician 411-A3	0	0	2	New Project. Carry out field surveys in drought prone areas; Design appropiate water systems; supervise the building of catchment & ferro-cement water storage facilities with the people; teach both local gov. workmen & villagers the necessary skills for building water catchment & storage facilities.		A.T. & Nutr. V's work with construction of water-seal toilets & ferro-cement water storage tanks as part of their primary project.
	Health/Public Health Engineer 411-A1	2	0	0	New Project. Demonstrate to the community, methods of water supply, waste disposal & housing & kitchen construction. Help communities survey, estimate & install water supply systems & water-seal toilets on a self-help basis.		
Kiribati	Village Health 441-A4	8	0	0	Upgrade existing wells, install well covers, hand pumps & rainwater catchment systems. Develop sanitary means of waste disposal including water seal latrines. Work with Island Health Council & put together health instructional materials.	WHO	Construction Aid V's build water catchment systems as part of their primary jobs.
Micronesia	Environmental Sanitation/Water Systems Advisor 401-B8	2	0	0	Train & assist water treatment plant operators in basic operation & maintenace of facility. Treatment includes sedimentation, filtration & chlorination.	Public Works Dept. of Palau	Health Ed. V's teach sanitary ed. as part of their primary jobs.
Morocco	Rural Water Supply 378-A1	14	0	20	Program is in start-up phase. Rehabilitation of Diesel & wind powered wells. Expansion of water supply system, well digging, capping & pump installation. Projects are all located in rural areas.	UNICEF	Voc. Ed. V's are involved with installing latrines & passive solar water heaters.

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		PCVs	PCTs	TRs			
Nepal	Community Water Supply 367-A1	14	6	10	Survey possible sites, collect survey data, design profiles, establish cost estimates organize village water committee & draw up a contract with the village. # 1 priority for the Gov. of Nepal & P.C. Nepal.	UNICEF CIDA German Vol. Service VSO JOCV Dutch Vol. Service	All Rural Construction V's build personal & school latrines as part of their projects. Most V's use their primary project as base from which to promote sanitary & health ed.
	Minor Hill Irrigation 367-C3	0	1	4	New Project. Survey, design, estimate & oversee construction (or renovation) of small rural irrigation proj. in the mountainous region. Train local people to understand & maintain system.	AID Dutch Vol. Service	
	Hydraulic Ram Development 367-B6	2	0	2	Oversee & supervise the voluntary village laborers in all aspects of construction of the hydroram, its housing, cement structures, pipe distribution system & taps. Train local people to understand & maintain the hydoram.		
Oman	Water Sanitation 381-A6	3	0	0	Construction of either dry pit latrines, bucket flush water seal privy, tank flush or flush toilet. Project being phased out.	UNDP WHO	
Papau New Guinea	Lumi-Integrated Village Dev. Women's Activities Coordinator 471-A4	0	1	0	New Program. Involved with appropriate technology which will include village water systems, simple construction techniques & sanitary projects & solar driers.		

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		PCVs	PCTs	TRs			
Philippines	Health/Community Dev. 492-A1	9	0	10	Total # of V's in prog. is 70 but 9 are working with water as primary job. Construction of potable water systems, outhouses & water-sealed toilets.	AID	V's in non-conventional Energy Dev./A.T. Spec. Prog. are involved with workshops or seminar for solar water heaters, micro-hydros & water-wheels. Ag. Prod. V's collaborate with water V's for construction of irrigation projects.
	Ag. Prod. 492-05	2	0	2	Total # of V's in prog. is 80 but 2 are working with water as primary job. Installation of irrigation systems. 3		
	Uplands Community Dev./ Water Systems Specialist 492-D0	3	0	0	Assist Uplands communities in design & construction of sanitary water systems. Design, drill & supervise construction on the most appropriate type of water system for that area Design & build a spring box & water delivery system, drilling for artesian water or setting up a pump for ground water.		
	Local PCV Administration 492-B0	1	0	0	Installation of potable water wells.		
Solomon Islands	Rural Water Supplies 431-B2	1	5	0	Survey of village water needs, plan work schedules & material requirements for building water system. Supervise & assist with installation. Train villagers in maintenance & repair of system.	AID Intn'l Human Assistance	

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		PCVs	PCTs	TRs			
Thailand	Water Resources Engineer 493-A7	15	0	0	Plan, design & supervise construction of sm. dams, spill ways & irrigation canals which will increase & control water resources for farming in rural areas.	AID	V's in Girl Guides Prog. are responsible for maintaining water systems on land settlements as part of their primary job. 1 of the Fisheries V's is working in collaboration with a water engineer to build a dam. Ag. Ext. V's are involved in building irrigation systems as part of their primary jobs.
	Land Settlement Engineer 493-DO	5	0	0	Construction & maintenance of village feeder roads, sm. dams, weirs, wells & ponds.	AID	
Tonga	Technical Services Water Project Management 421-A7	1	0	0	Supervise planning & construction of water systems. Provide technical expertise on rain catchment &/or tank construction.	FSP	Integrated Village Dev. V's teach sanitation in Adult Ed. classes as part of their primary job.
Tuvalu							V's in other projects are involved with building ferro-cement water tanks as part of their primary job.
Western Samoa	Water Resources Dev./ Rural Maintenance Supervisor 491-A4	2	0	0	New Project. Monitor pipeline systems using pressure & flow meters. Trouble-shooting system faults & taking corrective action setting-up fault reporting systems by working through traditional village hierachies.		Health V's work with improving sanitary conditions.
Yemen	Sm. Water Projects Construction 397-A1	16	3	11	Supervision of implementation of water system; masonry, concrete tanks, catchment cisterns, laying of water pipes & installation of pumps.	AID	
	Local Resources for Dev. 397-B5	3	4	5	Plan, design & construct water systems, schools & roads.		

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PEACE CORPS WATER/SANITATION ACCOMPLISHMENTS OF PROJECTS ON-GOING IN FY82

AFRICA REGION

Botswana

At the end of FY83 10 of 12 districts will have well established water units with trained local staff.

The Water Bole Hole Maintenance Program resulted in the creation of repair facilities, storeroom and stock replacement in 12 water maintenance offices.

Volunteers from the District Water Maintenance Program prepared and distributed instructional materials for the repair of existing equipment.

Reticulation of water systems for villages. Installation of 50-60 new systems, which are now self operational.

Volunteers developed a prototype of a pit latrine for a pilot project which is now being applied on a national level.

Cameroon

Trained over 100 Community Development Field Agents, initiated approximately 15 rural water projects and improved over 100 water points.

Gabon

The Ministry of Mines and Power is implementing a well digging program country wide to provide 320 selected regrouped villages with hand pumps. An extending PCV will begin a pilot wells project as a component of that project.

Ghana

Village facilitators have assisted District Councils and Village Development Committees within districts of six of Ghana's nine regions. PCVs have helped villagers plan, locate funding and resources, organize work groups and implement the construction of pit latrines, schools, community centers/libraries, bridges and culverts, earthen dams for water supply and health clinics.

Kenya

Technicians assisted 10 communities in completing major water projects; initiated three community-based well development programs; developed two community-based rain catchment programs; assisted with the design and construction of several smaller improved water sources and latrines.

The engineers have upgraded the staffs of provincial, district, and sub-regional water development offices. They have also surveyed, designed and/or supervised the construction of dozens of water systems.

Liberia

Completed potable water supply project using a gravity feed system in Yengema, Lofa County.

Completed construction of over 200 drilled, dug and spring wells (serving estimated 35,000 people).

Completed several latrines and schools.

Malawi

With Ambassador's Self Help Funds have constructed or will complete construction of 130 pit latrines and 140 shallow wells by the end of 1983, training seminar conducted for 250 health workers.

Have completed 200 kilometers of piping and installed 300 taps by May 1983.

Senegal

Assisted in well improvements, new wells and latrines. Water supply training at local training center and upgrading traditional well digging techniques.

Sierra Leone

Since the beginning of the Health/Rural Development Program, Peace Corps Volunteers have provided assistance and technical support to villages in the construction of wells, latrines, compost fences and health facilities. Exact production figures are unavailable.

Swaziland

Six or seven homesteads and one district school (approximately 200 people) now have running, sanitary water. This project has drastically cut the amount of people-time and energy spent on carrying water from distant sources.

Togo

Teams of social affairs agents coordinated by volunteers are currently working to organize the villages to accept the responsibility for the maintenance of the well pumps, organize a health/sanitation campaign and assist in the construction of family latrines. To date 250 villages have been contacted and the actual drilling and pump installation is underway. In FY83 Volunteers plan to establish and train 200 village health committees, undertake 175 secondary health/sanitation projects, design and implement a health education campaign and plan to begin village contacts in another region.

Upper Volta

The Rural Water Supply Project funded by AID is designed to provide the rural people of southwestern Upper Volta with a potable water supply which will meet their minimal daily requirements of 10 liters per person per day; an estimated 620 wells will eventually be dug in approximately 550 villages and an effective community health education program to maximize the potential health benefits inherent in an improved water system.

NANEAP REGION

Micronesia

Designed, equipped and assisted in the construction of a water and wastewater laboratory in Truk and trained two Trukese laboratory technicians; developed training manuals for sanitarians in all districts of Micronesia; designed operators' manuals for the Truk and Ponape wastewater treatment plants; advised Environmental Protection Board staff on current wastewater plant operations in all districts of Micronesia.

Nepal

Rural Construction: Over the past ten years Peace Corps Volunteers have surveyed, designed, and overseen the construction of over 100 rural drinking water projects in Nepal (8 in 1981) reaching an estimated 75,000 people. These systems have a direct and immediate effect on health and labor by providing generally safe water and significantly reducing the labor costs of carrying water.

Over the past five years, rural construction PCVs have had an important and direct effect on both the quality of water systems being built and on the number of qualified Nepali manpower required to meet HMG's very ambitious objectives in water supply. During this period PCVs have helped provide on-the-job training to 25 Overseers and 75 Technicians, adding greatly to the pool of trained manpower. They have also improved system quality by standardizing designs and, by using the hydro-ram pump, introduced water where systems were previously not possible.

Peace Corps Volunteers (and volunteers from other agencies) played a major role in establishing a national water and supply maintenance program.

Philippines

Have completed five barangay potable water systems, one spring development project, two upland community potable water systems and construction of barangay outhouses and water-sealed toilets which will benefit 35 families as part of environmental sanitation program.

Construction of 100 dug wells through joint Peace Corps/Canadian Embassy Environmental Sanitation project.

Solomon Islands

Provision of adequate supplies of potable water to every village in the country within 10 years is a major goal of the government's rural development commitment.

Of the visible accomplishments of community development aides, the most obvious are the water systems established at the Anulighi Resettlement site and at Bambanikira village. Both were major efforts, funded from outside sources sought and arranged by the PCVs, and both have made significant impact on the lives of community residents. Water is now available in the villages at all times, thus saving the women's labor, previously required for carrying water. And since all of the water outlets in the systems are equipped with shower heads as well as taps, there is a general tendency for people to "swim" (Pijin for bathe) more frequently.

Thailand

In 1982, 15 volunteers in the water resources program completed construction of 2 irrigation canals, 3 irrigation check structures, 3 box culverts, 3 earth dams with reservoirs, 6 R.C. diversion dams, 1 windmill with water pump, 1 suspension bridge and 2 large farm ponds. The total value of the construction projects was apprxoimately US$320,000. They affected the lives of about 1,600 farm families (approximately 9,600 people). In addition an average of 5 projects were surveyed and designed by each volunteer engineer for a total of 75 projects.

The work of these engineer volunteers in the past has begun to demonstrate the value of the small water projects to the Thai Government. The Water Resources Development Committee has been set up under the Prime Minister's Office since 1980. It has promised greater financial outlay to small water resources development projects instead of expanding the construction of big irrigation projects.

Agriculture extension, TEFL and health volunteers (1981-82) have constructed 40 shallow wells, 10 windmills, 25 water storage tanks, 1 water supply project. The total value of the construction projects was approximately US$17,771. They affected the lives of about 700 rural families (approximately 4,200 people).

Tonga

Plan to provide 89 5,000 gallon cement water tanks over a three year period and 44,630 square feet of rain water catchment roof area to fill cement water tanks over a three year period.

Yemen

Several water projects have been completed ranging in complexity from single spring boxes to water tanks with gravity feed distribution systems.

INTER-AMERICAN REGION

Eastern Carribean

Two civil engineers on Dominica have contributed significantly to rural infrastructure improvement in their design and supervision of road, bridge and water systems.

Ecuador

Water volunteers are involved in the design and construction of six community water systems, the installation of 80 manual pumps and the training of 30 promoters who will maintain the pumps and systems.

Energy volunteers are expected to complete construction of 30 solar water heaters in 1982.

Guatemala

Through the introduction of a potable water system, the community gains an improvement in health conditions and a freeing of time for economic activities once spent in water collection. To date:

- 30,000 individuals have benefitted from this project
- 10 projects have been executed serving a population of 18,000 persons
- 17 projects under construction to benefit 15,000 persons
- 9 topographic studies completed
- 10 designs for systems finished
- 40 counterparts trained
- 12 feasibility studies realized
- 13 potable water systems plans completed

Honduras

1,000 latrines and 50 wells have been built.

Paraguay

Volunteers have been involved in the following:

- inspections of 4,845 houses and sanitary facilities
- construction of 346 sanitary latrines
- repair of 153 latrines
- dug 53 wells
- installed 18 water pumps
- protected 16 springs
- made visits to 4,362 families in health education
- interviewed 1,421 families in local health posts
- participated in 76 classes involving sanitation education
- conducted six potable water education classes
- discussed water and sanitation at 296 health committee meetings

SECTION 4

LIST OF COLLABORATING AGENCIES INCLUDED IN REPORT

This listing represents international and donor agencies who are involved in collaborative activities with Peace Corps. The information was gathered through discussions with Country Desk Officers and review of the Country Management Plans reflecting collaboration from Dec. 1981 through the present. More specific information on Peace Corps collaboration can be obtained from a preliminary report that was prepared by the Office of Programming and Training Coordination in April 1981.

AGENCY	ACRONYM
Agency for International Development	AID
Baptist Mission/Senegal	
Canadian Embassy/CIDA	
CARE	
CARITAS	
Catholic Development Fund	
Catholic Mission	
Catholic Relief Services	CRS
Christian Action for Development in Eastern Caribbean	CADEC
Dutch Embassy (Netherlands)	
Dutch Volunteer Service	
Ecuadorean Water Institute	IEOS
Eglises Chretiennes Zairoises	ECZ
European Economic Community	EEC
European Development Fund	FED

Executive Unit of Rural Aqueducts Program (Ministry of Public Health)	UNEPAR
Fed. Republic of Germany	
French Voluntaires Progres	
Fonds Assistance et Cooperation	FAC
Foundation of the Peoples of the South Pacific	FSP
German Volunteer Service	
Inter-American Development Bank	IDB
International Human Assistance	
Japanese Overseas Cooperation of Volunteers	JOCV
OXFAM (United Kingdom)	
Pan American Health Organization	PAHO
Servicio Nacional de Saneamiento Ambiental	SENASA
Save the Children	
Sweden/SIDA	
Unidad Technica Operaciones de Campo	UTOC
United Nations Children´s Fund	UNICEF
United Nations Development Program	UNDP
United States Embassy Self Help Fund	
Voluntary Services Overseas (British)	VSO
World Bank	IBRD
World Health Organization	WHO

Regional and Overseas Staff Interviewed

Africa Region

- Anika McGee, CDO, Kenya, Malawi, Tanzania

- Kay Kennedy, CDO, Zaire
  Kattie Wheatley, CDA, Zaire

- David Browne, CDO, Botswana, Lesotho, Swaziland
  Norman Rush, PCD, Botswana

- Gary Laidig, CDO, Togo, Benin, Ghana
  Marcia Daigle, CDA, Togo, Benin, Ghana
  Don Boekelheide, PCV, Togo
  Phebe Prescott, PCV, Togo

- Steve Reid, ACDO, Mali, Niger, Upper Volta

- Ronnie Williams, ACDO, The Gambia, Liberia
  George Scharfenberger, PCD, The Gambia
  David Selby, RPCV, Liberia

- Elena Hughes, CDO, Senegal, Sierra Leone

- Leanora Orr, RPCV, Cameroon

Inter-America Region

- Dexter Katzman, CDO, Jamaica, Belize, Eastern Caribbean

- Eugene Rigler, CDO, Ecuador, Costa Rica

- Maria Lameiro, CDO, Honduras, Guatemala

- Noreen O'Meara, CDO, Paraguay, Dominican Republic

- Ray Victurine, Consultant, Paraguay, Guatemala

NANEAP Region

- Chris Ullrich, ACDO, Philippines
- Susan Belmont, ACDO, Thailand, Papau New Guinea
- Phyllis Jones, ACDO, Western Samoa, Fiji, Tuvalu
- Bill Dant, CDO, Morocco
- Martha Kichorowsky, ACDO, Nepal, Oman, Yemen

Office of Program Development

- Roger Palm, Fisheries Specialist
- Franklin Moore, Agriculture Specialist

PRINCIPAL ABBREVIATIONS AND ACRONYMS USED

ACDO - Acting Country Desk Officer
CDO - Country Desk Officer
CDA - Country Desk Assistant
NANEAP - North Africa, Near East, Asia and Pacific
PCD - Peace Corps Country Director
PCV - Peace Corps Volunteers
RPCV - Returned Peace Corps Volunteer

A SURVEY OF PEACE CORPS PROJECTS
WITH WATER/SANITATION ACTIVITIES
FROM 1970 THROUGH 1982

Phase I of the Peace Corps Water/Sanitation
Case Studies and Analyses Project

January 7, 1983

Creative Associates, Inc.
Contract no. PC-382-1005

INTRODUCTION

Phase I provided a history of Peace Corps projects with water or sanitation activities and laid the research base for selecting ten country programs with the potential for more indepth research (Phase II). From the ten country programs suggested, five were chosen to represent the different regions as case studies (Phase III).

Over 200 Peace Corps projects with water or sanitation activities from 1970 through 1982 were identified. The research for Phase I produced a history of projects integrating water or sanitation activities which demonstrate Peace Corps' performance in meeting basic human needs (BHN) and improving quality of life through:

- clean water supplies to reduce morbidity and mortality;
- water supplies where there were none before;
- irrigation to improve food production and provide year-round domestic water supplies;
- education in sanitary use of water and water sources; and
- prevention of water-related diseases through health education.

One significant observation is how many Peace Corps projects actually had a water or sanitation component though they may have been titled Agriculture, Health, Community Development, Municipal Works, Rural Infrastructure, Natural Resource Conservation. Water and sanitation are probably the most common threads through the various sectors. This fact is particularly noteworthy considering the list does not include all of the Peace Corps teachers, community development workers, agriculturalists, and engineers who worked on wells, latrines, pumps, and irrigation systems or who taught sanitation or prevention of water-related diseases such as malaria, onchocerciasis, and schistosomiasis.

Projects were selected for Phase I if documents indicated any water-related or sanitation activities. These include efforts related to wells, irrigation, water conservation, and prevention of diseases caused by poor hygiene/sanitation or by water-related vectors. Fisheries projects were not included as they are defined as a separate sector.

This list is based only on information contained in project plans. Information sources used in identifying the projects include: the ICE library, Washington Regional Chiefs of Operations, country desk units, country management plans (CMPs) and trainee assignment criteria sheets (TACS), the Placement Office, the Peace Corps Reservations Center, Office of Volunteer Support Services, Planning Assessment and Management Information Office, Peace Corps Archives, and former Peace Corps Volunteers (PCVs) and staff.

Though the information resources appeared formidable in quantity, they were rarely complete for research purposes. The information available in Washington is largely related to program planning. There are very few program implementation or evaluation data available and, as a result, there is little indication of success or failure. It was not unusual to find reference to a project in one country management plan and then find no mention of it again. Therefore, years of project life are frequently unknown as well as the exact numbers of Volunteers who served in the specific projects. Project numbers were frequently changed year by year since part of the number is the country's internal priority code. This made tracing the same project back over the years difficult.

Phase I projects are presented by region and country. Information on each project is categorized into project name and number, year(s) during which the project was active, description of project activities, and size of project by number of volunteers.

PEACE CORPS
PROJECTS WITH WATER OR SANITATION ACTIVITIES, 1970 through 1982

AFRICA REGION

Countries included:

- Benin/Dahomey
- Botswana
- Cameroon
- Central African Republic (Empire)
- Chad*
- Gabon
- Gambia
- Ghana
- Ivory Coast
- Kenya
- Lesotho
- Liberia
- Malawi
- Mali
- Mauritania
- Niger
- Senegal
- Sierra Leone
- Swaziland
- Tanzania
- Togo
- Upper Volta
- Zaire

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*Peace Corps is no longer active in this country.

PEACE CORPS
PROJECTS WITH WATER OR SANITATION ACTIVITIES, 1970 through 1982
Africa Region

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Benin/Dahomey			
Irrigation	1970-74	PCVs taught farmers to construct low-cost wells and install bull-drawn bucket lifts for irrigation through the Rural Public Works Service.	Small
	1972	PC provided a civil engineer to maintain heavy equipment and supervise construction of irrigation system for 1,000 acres of rice land in Oueme Valley (dikes, canals).	Small
Rural Community Development--Wells	1972	With materials from U.S. Embassy Self-Help Funds, PCVs in Rural Public Works Service supervised the construction of 10-12 wells (water table 150-180 feet).	Small
	1972	PCVs taught health and sanitation practices on individual and village level.	Small
	1973	PCV elementary school teachers developed curriculum in health education.	Small
Village Health and Sanitation 680 A2	1981	Project goals are for AID to provide water to 250 villages by 1985. PCVs provide health education and sanitation, build latrines, train VHWs, and work to reduce water related diseases by 45%.	Small
Rural Water Supply 680 B0/A10	1982	PCVs involved in spring captivation, pump maintenance, and large bore well construction.	

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[1] Projects before 1978 were categorized in Management Unit Numbers (MU#).

[2] For the most part, the year(s) shown indicate year(s) researcher found written documentation on a project. Seldom was there an indication of beginning and ending dates.

[3] In the research data, sometimes only project goals are mentioned and activities are implied; in other instances, PCV activities are given and therefore the project goals are implied.

[4] Project size is indicated as follows: "Small" represents under 5 volunteers; "Medium," 6-12; "Large," 13 or more. Number of volunteers varied from year to year, therefore this label indicates an average.

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Botswana			
Dam Building MU# A-7-1	1973-74	PCVs set up and trained building teams and constructed small dams in rural areas to catch and hold rain water for cattle, irrigation, and domestic use. Success.	Small
Rural Water Installation 637-C4	1977-present	PCVs provide simple water transfer systems to 130 small villages and supervise installation of reservoir, pipe, and faucet systems.	Small
Water Management 637-B5	1978-present	PCVS fill roles of assistant works superintendents, dam building advisors, and biological lab technicians. PCVs supervise construction projects and research water collection and storage methods.	Small
Water Borehole Maintenance 637-A1	1978-present	Goal is self-sufficiency in food production through better food supply. PCVs repair and maintain boreholes; teach basic mechanical engineering. PCVs assist District Councils in maintaining village water reticulation systems. Failure 1978-79; Success 1980-82.	Medium
Health Services 637-A3	1980-present	PCVs improve sanitation, provide Bilharzia survey officer.	Large
Environmental Sanitation 637-C6	1980-present	PCVs field test awareness campaign techniques and materials and train Batswana in self-help latrine construction. PCVs started pilot project including preparation of educational materials for start-up of national project.	Small
District Water Maintenance 637-C3	1979-present	PCVs supervise district-wide maintenance and repair of boreholes and reticulation schemes.	Medium
Brigade Technical 637-A7		PCVs provide borehole mechanics instruction to rural youth who are getting on-the-job training.	
Renewable Energy Technology 637 DO	1982-present	Project is in developmental stage and is designed to promote renewable energy technologies, especially in the areas of domestic technology such as cooking, water and space heating, grain milling and water pumping.	Small

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Cameroon			
Health Education 694 A2 MU# E-1-4	1977-present	PCVs teach basic health practices and nutrition; organize village health committees with secondary emphasis on potable water supplies and environmental sanitation; build latrines; clean and maintain water sources; and teach hygiene. Program is being phased out but programming potential exists in water/environmental sanitation.	Large
Women in Development 694 A3	1978	PCVs with Cameroonian counterparts formed teams to work in villages. Five year goals were: one latrine per family; one water source per village; functioning cooperatives in each village; and training of women to teach maternal/child care, sanitation, and basic home-making skills.	Medium
Central African Republic (Empire)			
Small Bore Wells Installation and Maintenance 676 A5/A4	1976-80	Project was modeled after Chad project. Objectives were to drill 250 wells in four years. PCVs were involved in installation and maintenance of small bore wells in rural communities. Health education was a secondary component of the project.	Small
Rural Village Health Project 676-A3	1977	Project goals were to strengthen rural health care delivery. PCVs organized village health committees; identified village health agents to initiate clean water and waste disposal systems; and developed educational materials and visual aids.	Medium-Large
Village Water Resource Improvement 676 B2 MU# A-1-1	1978		
Ouham Perde Rural Development Health 676-A9	1980-present	Project goals are to form primary village-based health care system: construct latrines; clean up springs; and advise village health committees.	Medium

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Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Chad			
Lake Chad Development	1966	PCVs established new techniques in irrigation, farming, and forage, and established nurseries for propagation of trees for wind breaks.	Small
Wells Installation 677 A1	1967-78	PCVs were involved in installation of small bore, closed wells in villages and at rural dispensaries and in training of Chadian counterparts.	Medium
Health Education	1970-79	Project goals were to expand the school health program. PCVs worked with mobile teams of Endemic Disease Service to train rural dispensary nurses in health education.	
Gabon			
Primary School Health Education 676-B3	1980-present	PCVs train primary school teachers in health education including environmental improvement in primary schools and communities; build latrines; they have adapted Manuel D'Hygiene Scolaire.	Medium
Gambia			
Community Development 635-A5	1976-present	Project goals were to improve village infrastructure with goal of community self-help. Project included plans for well digging scheme.	Large
[Merged with 635-B4 in 1981.]			
Rural Water Supply Project 635-A3 Split into 635-B3 and 635-B4 (B4 titled Rural Training)	1976-present	Goals are to provide water for human, animal, and agricultural purposes and to contribute to sanitation and health. PCVs dig and construct wells and provide health education along with water supply.	
Rural Health and Nutrition 635-A1	1978-present	Project goals were to improve nutrition and food supply and control communicable diseases. PCVs teach preventive measures in water supply and use, and environmental sanitation.	Large

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Ghana			
Crop Extension 641-B9	1977-80	Project goal was to increase vegetable production with improved growing and irrigation techniques.	Small
Small Farmers Development Project; 641-A4	1979-present	Project goal is to increase vegetable production for 5,000 small farmers through improved water use.	Medium
[641-A4 and 641-B9 merged in 1980.]			
Irrigated Food Production Project; 641-A3	1978-present	PCVs work to develop irrigation system to improve water conservation and increase land under cultivation; and design and repair small dams to irrigate 5-50 acres.	Medium
Rural Construction 641-A6	1978-81	PCVs trained 450 technicians and extension workers in construction techniques including water facilities and waste disposal systems.	Medium
Community Health Care 641-A1	1979-present	Project focus is on communicable disease control and rural sanitation.	Large
Village Community Development 641-A2	1979-present	PCVs work as community organizers and technical advisors to help implement local development committee projects to provide latrines, bath houses, spring treatment, and filtration systems. Canadian International Development Agency provides water resources (bore holes with handpumps). PCVs work with sanitation/community development aspects, construct extended pools around boreholes, build bath houses, and promote village maintenance of pumps and wells.	Medium
Ivory Coast			
Rural Nutrition, Hygiene, Sanitation Education MU# R-1-1	1975	Project goals were to improve village nutrition and sanitation. PCVs demonstrated water purification and construction of latrines; showed educational sanitation films; and selected and trained village health workers.	Small

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Kenya			
Water Development 615-A1	1978-present	Originally, PCV engineers upgraded staff of Provincial, District and Subregional Water Development Offices; and surveyed, designed, and/or supervised construction of water systems. Project revised in 1980. Now, engineers backstop skill-trained PCVs who initiate community-based well development programs; develop community-based rain catchment programs; assist in design and construction of smaller improved water resources and latrines; and complete major water projects in communities.	Medium
Rural Construction 615-B6	1979	Project goals were water resource developmentfor agriculture and irrigation.	Small
Rural Health Development Program 615 A3	1980-present	PCVs assist Ministry of Health to meet health delivery service needs in rural communities by providing health education trainers. PCVs coordinate and promote health information.	Medium
Lesotho			
National Park/ Environmental Protection MU# A-3-1	1975	PCVs performed studies on appropriate streams for game fish stocking and constructed slab bridges.	Small
Urban and Rural Development 632-B3/A9	1976	PCVs assisted the Government of Lesotho in designing, building, and maintaining water systems and bridges and trained local counterparts.	Medium
Clean Water 632 B8	1980-present	To address typhoid and amoebic dysentery problems and provide safe water supply, PCVs design, construct and maintain new and existing rural water supply systems.	Small

[Note: Projects 632-B8 and 632-B3 were joined in 1980.]

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Liberia			
Rural Development/ Appropriate Technology 669-A2	1972-present	Goals are to provide basic consistent and sanitary potable water service for rural inhabitants and to emphasize hygienic use of water resources. Volunteers assigned to the Ministry of Local Government supervise and train coworkers in spring box construction and hand-dug and drilled well construction. PCVs construct water-seal toilets, hydraulic ram pumps, village water systems (also solar dryers, mud ovens, bee hives, rice threshers, charcoal production systems). Wells and Toilet Construction Project grew out of Rural Construction Worker Program.	Large
Preventive Medical Services 669-A1	1974-present	Goal is to reduce infant mortality, communicable diseases, malnutrition, and overall morbidity and mortality. PCVs construct spring boxes; improve sanitary conditions; demonstrate proper disposal of sewage; build latrines; and organize and implement inservice training programs for rural health workers.	Large
Home Economics Extension MU# B-3-1	1977-78	PCVs trained home economic extension aides in child care, nutrition, and sanitation.	Small
Malawi			
Rural Water Supply 614-C-2/A3	1979-81	PCV rural water supply officers supervised and managed construction activities; assisted in design, implementation, evaluation of piped water schemes at village level; and conducted workshops on use and maintenance of wells.	Small
Preventive Health Services 614-B-1/A2	1979-present	PCVs assess village level sanitary facilities; construct/upgrade village level sanitary facilities (water supplies, latrines); increase attendance at preventive health facilities; and conduct workshops to upgrade skills of Malawian staff (teach mobile teams).	Large

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Mali			
Preventive Health 688-C1	1979	PCVs taught disease prevention; treated stagnant ponds to clear them of parasites; purified wells; and constructed latrines.	Small
Rural Works 688-CO	1979	Through community organizing, PCVs determined feasibility of supporting labor intensive construction activities such as building small dams and deepening wells.	Small
Community Development 688-A2	1980-present	Project goals are to improve standard of living in health, socioeconomic, and agricultural areas in villages. PCVs involved in community organizing through development activities which include wells construction and improvement and construction of water pumps.	Medium
Mauritania			
Agriculture Production and Rural Development	1974-79	PCVs performed irrigation pump repair and maintenance; trained counterparts; demonstrated agricultural irrigation at college; and repaired earthen dams.	Small
Rice Production 682-A3	1979-80	PCVs involved in water management; water pump maintenance/supervision; and repair and maintenance of irrigation canals.	Small
Preventive Health Education 682-A	1982-present	PCVs develop preventive health approach through community *animation*.	
Niger			
Agricultural Public Works (Wells)	1968	Goals were to provide constant, safe source of water. PCVs assisted in construction of self-help village wells.	Medium
Agricultural Survey 683-A4	1978	PCVs served as survey team leaders in national survey to identify, study, and document marsh sites, with a view to either small-scale or extensive development as year-round water resources.	Medium

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Senegal			
Rural Development/ Animation 685-C3/A4/A2 MU# S-1-1	1966-present	PCVs work as community development workers in villages aiding community groups to be more productive and self-reliant. PCV activities include: income-generating projects, usually agriculture related; quality of life improvement projects, often health/sanitation related; and training of village committees to take over projects. Training is in technical areas and management. Project-specific activities since 1970 include: digging wells (10 per year); repairing/ improving wells (20 per year); installing hand pumps, windmills; developing animal traction systems (10 in last five years); building latrines (simple slab and ventilated pit privies, 250 over life of program); developing simple, gravity-fed irrigation systems for truck and kitchen gardens and animal traction systems for rice production; and installing diesel pumps for rice and tomato production. In the first 12 years of project, individual village counterparts/animators were trained. Since 1978, concept of counterpart includes a village development committee to continue activities after departure of PCV.	Large
Machinist 685-BO	1978	PCV taught local craftsmen to fabricate spare parts for diesel pumps which pump 40% of country's water supply.	Small
Primary School Health Education 685-A5	1980-82	Project goals included health education including sanitation. PCVs developed teacher health manual; upgraded competency of school teachers; organized sanitation campaigns.	Medium

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Sierra Leone			
Rural Community Development Project	1962-65	PCVs worked in rural community construction, fisheries development, cooperative education, and medicine. In 1964, the fisheries and cooperative education aspects were eliminated and the project focused on rural construction using local materials and labor.	Medium
Chiefdom Develment Project	1966-72	Volunteers worked with the Department of Agriculture to introduce techniques to increase crop yields, including better water control and irrigation systems and agricultural/nutrition extension.	Large
Agricultural Extension Project (in 1979 became Small Farmers Project	1971-present	PCVs have worked in agricultural extension with emphasis on irrigation systems and water control for rice production.	Large
Rural Water Supply Project	1972-73	Through the Ministry of Works, PCVs provided design, logistical, and technical support, and supervision, to a program to establish clean, year-round piped water to rural towns. Included training of counterparts.	Large
Eastern Region Integrated Agricultural Development Project (IADP)--Kenema	1974-present	PCVs have dug wells in villages under 1,000 population and constructed piped water systems in villages of 3,000 or more people.	Small
Provincial Village Water Supply Project MU# E-00-1	1976-78	PCV engineers designed water systems for villages, trained and supervised counterparts and local labor.	Small
Northern Integrated Agricultural Development Project (NIADP)--Makeni	1977-80	This project included well construction and instruction of communities in water and sanitation issues. PCVs worked in well design and materials development, and acted as community extension workers.	Small
Rural Health Development Project	1978-present	Project goals were to teach nutrition, hygiene, and disease prevention; assist in immunization programs; train paramedical personnel; improve sanitation practices and facilities, as well as potable water supplies.	Large
Small Farmers Project	1979-present	Continuation of Agricultural Extension Project.	Large

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Sierra Leone (continued)			
MEP/RWSU--IADP--PC Projects	1980-present	This program emphasizes supply of water through hand-dug wells to villages; establishment of health committees responsible for local participation in well construction, use, and maintenance; environmental health.	Medium
Swaziland			
Rural Health Services 645-B1	1977-present	Water-borne disease program and Bilharzia control. PCVs collect data on water snails, identify areas of infestation, and work with communities on preventive measures.	Small-Medium
Rural Land Development 645-A6	1978	Project goal was to plan and develop water sources for rural development areas (potable and washing facilities). PCVs designed and built irrigation scheme for 150 acres of crop land, with three reservoirs; prepared land use maps and resettlement plans; and built weir.	Small
Water Resources 645-A2	1978-79	PCVs conducted water need surveys and land surveys to plan water systems; installed pipelines; built pumphouses and reservoirs; and repaired old water systems.	Small
Appropriate Technology 645-B7	1982	PCVs provided technical assistance in damming of water sources and piping of clean water to school location, using gravity piping and installing faucets. Project completed.	Small
Tanzania			
Village Development 621-A4	1979-82	Project goals were to promote Utilization of Hydrotechnology for Agriculture Intensification (UHAI), including small-scale irrigation for farmers and water supply--hand-dug ring wells with wind pumps for 10-20 families per well.	Small
Zanzibar Environmental Health 621-A6	1982-present	Project goals are malaria and schistosomiasis control.	Small

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Togo			
Rural Community Development/ Rural Infrastructure Program 693-A2/A3	1963-present	PCVs supervised construction of dug wells, trained counterparts in construction techniques and maintenance, and initiated village sanitation programs. They were agricultural extension agents, community development agents, and architects working in areas from animal traction to school construction.	Medium
Health Education	1969-78	Volunteers promoted preventive medicine through health education in schools and dispensaries. They developed manuals and posters still in use today. PCVs also constructed latrines, wells, and cisterns.	Medium
Rural Water Supply/Environmental Sanitation Project 693-BO	1981-present	AID-funded community development/education project in Ministry of Social Affairs supervised by Peace Corps. Objective is to organize villages to maintain well pumps, construct family latrines, and organize health/sanitation campaigns.	Medium
Upper Volta			
Hand Dug Village Wells 686-A2/A12	1967-82	Project goals included using compressors to dig below water table; making wells permanent and safe from contamination; training masons and teaching construction; and improving planning and logistical support systems.	Medium
Agricultural Construction 686-B2/C2	1978	PCVs assigned to villages to assist in the technical work necessary to complete small dams, dikes, and canals which provide water for crop irrigation. PCVs also involved in the installation of hand pumps for hand-dug wells.	Small
Health Animation 686-A3	1978	Project goals were to "animate" people to solve own health problems--sanitation, first aid, nutrition.	Small
Village Health/ Sanitation 686-C3	1981-present	PCVs act as mid-level extensionists and work on rural water supply projects funded by AID.	Small

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Zaire			
Public Works MU# A-8-1	1974	PCVs carried out well drilling.	Small
Health Systems Development 660-A5 MU# A-6-4	1975-present	[Formerly called Basic Family Health, pre-1979]. Project provides intensive community organization to develop health infrastructure, including maternal and child health; basic sanitation; immunizations and safe water supply; and training of Zairian health workers and counterparts.	Large
Rural Water Supply 660-A3	1978-present	Goals are to increase life span and productivity of rural villagers. Project provides PCV water supply technicians and construction supervisors who construct sealed catchments. PCV rural sociologists educate villagers in causative relationship between poor health and water supply.	Small
Rural Development/Appropriate Technology 660-B8	1981-present	Project designed to improve quality of rural life and increase agricultural production, incomes, and sanitation standards. PCVs involved in water resources management.	Medium
Rural Development/Rice Extension 660-A7	1980-82	Project goals were to increase irrigated rice production by two to three times.	

PEACE CORPS
PROJECTS WITH WATER OR SANITATION ACTIVITIES, 1970 through 1982

INTER-AMERICAN REGION

Countries included:

- Belize
- Brazil*
- Chile*
- Colombia*
- Costa Rica
- Dominican Republic
- Eastern Caribbean
- Ecuador
- El Salvador*
- Guatemala
- Honduras
- Jamaica
- Nicaragua*
- Paraguay
- Peru*

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*Peace Corps is no longer active in these countries.

PEACE CORPS
PROJECTS WITH WATER OR SANITATION ACTIVITIES, 1970 through 1982
Inter-American Region

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Belize			
Rural Health Care 535 A3 MU# B-3-4	1971-present	Project goals are to reduce infant morbidity and mortality; improve general health in rural communities; upgrade sanitation standards; work toward malaria eradication; and provide for installation of potable water systems.	Medium
Village Water Supply Systems MU# A-7-7	1975-77	Project combined in 1976 with Rural Health Care (535 A3) and nutrition education and malaria erudication.	Small
Environmental Sanitation	1976-79	PCVs encouraged proper human waste disposal through health education and provision of slabs and risers for construction of outdoor latrines.	Small
Brazil			
Paraiba Agriculture Assistance: Rural Community Development/Wells	1967-74	Male PCVs fostered farmers association activities (privy campaigns). Female PCVs worked with women in gardening, canning, nutrition, hygiene.	Medium
Amazon Agricultural Development	1969-74	PCVs provided technical assistance to host agency to develop small-farmer irrigated rice technology.	Medium-Large

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[1] Projects before 1978 were categorized in Management Unit Numbers (MU#).

[2] For the most part, year(s) shown indicate year(s) researcher found written documentation on a project. Seldom was there an indication of beginning and ending dates.

[3] In the research data, sometimes only project goals are mentioned and activities are implied; in other instances, PCV activities are given and therefore the project goals are implied.

[4] Project size is indicated as follows: "Small" represents under 5 volunteers; "Medium," 6-12; "Large," 13 or more. Number of volunteers varied from year to year, therefore this label indicates an average.

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Brazil (continued)			
Community Development--Pernambuco/ Alagoas	1972	PCVs formed community action groups to act on health, education, and sanitation.	Small
Waterworks Maintenance MG/E-10-02	1972-74	PCVs improved state water supply systems by training counterparts in maintenance and repair of hydraulic pumps and by improving operational systems for water treatment plants.	Small
Minas Gerais Waterworks	1972-74	PCVs worked on recuperation and maintenance of waterworks equipment; researched, designed, and installed rural waterworks.	Small
Rural Electrification MU# PE/A-14-03	1972-present	PCVs assume cooperative electrician role in interior communities in Pernambuco; serve as advisors to Coop's Board of Directors and provide technical assistance for feasibility studies (amperage, switching systems, type of motor) and farm operations such as irrigation.	Small
Irrigation/Water Systems MU# RN/A-07-01	1973	PCVs designed and implemented irrigation project study to determine soil properties, water table, and soil drainage properties; determined appropriate irrigation systems for cotton, tomatoes, corn, etc., considering infiltration and inundation techniques, appropriate types and sizes for pumps and costs for identified systems; and developed and administered credit plans for irrigated plots.	
Technical Health Skills	1974	PCVs provided technical skills to mini-health posts and promoted preventive medicine and public health (latrine building, use of water filters).	Small
Home Economics Extension MU#s: 1974, CE/A-10-01 1976, K-2-1	1974-76	Through group meetings, home visits, courses, and training programs, PCVs organized teacher training in basic necessities of the rural family; motivated rural communities to construct and administer health mini-posts, promote latrine building, use of water filters and boiled water, and teach personal hygiene; taught concept of balanced diet; and demonstrated hygienic preparation of meats and vegetables.	

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Chile			
Watershed Management 513 B8	1979	PCV assigned to National Forestry Corporation to initiate erosion control pilot projects in one region of the country for demonstration and data gathering purposes; and worked with a team to develop detailed studies and plans for multiple purpose watershed improvement/reforestation in same region.	Small
Health Education 513 A1	1980	PCVs developed and implemented health/nutrition education programs with mothers' clubs, rural schools, Red Cross, etc.	Large
Colombia			
Home Economics/Nutrition 514 A1 MU# N-1-4	1978	PCVs built latrines and installed water filters in homes.	Large
Environmental Protection/Conservation 514 A6 MU E-1-1	1978	PCVs involved in the provision of watersheds planted for rural aqueducts; pilot plots for reforestation with native species organized with seedlings planted on watersheds; pilot projects for conservation education; and books on conservation education.	Large
Costa Rica			
Forestry/Conservation Natural Resources 515 B2 1978 MU # C-1-1	1970-81	Project goals were to save soil and water lost through deforestion. PCVs provided technical cooperation and training services to counterparts and farmers and encouraged conservation of principal watersheds.	Small
Urban Development & Public Works MU C-35	1972-76	PCV engineers designed and constructed wooden bridges, water systems, and sewer systems.	Small
Irrigation MU# B-1-1, 1977 MU# D-3-1, 1976 MU# A-7-9, 1974	1974-79	Project goal was to increase agricultural output. PCVs performed feasibility studies and developed plans for establishment of irrigation district covering 1,500 hectares; constructed dams, canals, and holding tanks.	Small

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Costa Rica (continued)			
Nursing and Other Health Services MU# A-2-4	1976-77	PCVs were involved in teaching hygiene and providing education in preventive medicine.	Large
Appropriate Technology Instructors 515 B3	1978-82	PCVs taught in schools and conducted research and extension projects including design of home-size solar water heater and solar water heater for sports complex swimming pool.	Small
Environmental Education 515 C9	1978-present	PCVs demonstrate environmental education in rural villages involving school teachers and community leaders.	Medium
Community Health Education and Development 515 B9	1980-present	PCVs work as community development workers and health promotors who develop environmental sanitation projects; demonstrate how to plant small gardens and develop small animal projects; improve home hygiene and environment and build latrines and wells.	Medium
Forestry 515 C8	1982	Project provided technical assistance (extension) to farmers with some PCVs working in watershed management.	Medium-Large
Dominican Republic			
Hydrology Survey (Rural Potable Water Supply Program) 517 A4	1978-79	PCVs conducted studies regarding subsurface water available for drilling wells for potable water for use in 132 rural communities (total population, 140,000).	Small
Rural Development 517 A1	1979-82	PCVs worked to promote horticulture, small animal production, general community development; improve potable water systems; irrigate agricultural land; and construct latrines and showers.	Large
Eastern Caribbean			
Dominica Self-Help Rural Construction 538 A1		PCVs involved in construction of community centers, roads, village reservoirs.	

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Eastern Caribbean (continued)			
Barbados Soil and Water Conservation MU# B-1-1		PCVs developed overall land use map for Barbados which outlines preferable areas for agriculture based on soil safety and water availability.	
Public Works	1970	PCVs assisted Water Works Department in expanding and improving water system, designing public buildings, and training draftsmen.	Large
Community Development	1982-present	PCVs involved in community self-help construction projects including water systems development, feeder roads, bridges, homes, and public buildings.	Medium
Ecuador			
Rural Electrification MU# E-01-5	1975	PCVs worked on hydroelectric plant and provided assistance with installation of generators and extending lines to towers.	Medium
Rural Infrastructure Project 518 A5 1976 MU# E-0-21	1975-present	PCVs involved in feasibility study for potable water system, school construction, building bridges, and latrines. In 1975, project merged CREA professional services, Rural Community Development, Corporate Management Assistance, and School Construction.	Large
Home/Community Improvement 518 A4	1978-79	PCVs taught short courses in basic nutrition and food preparation; prepared home gardens; assisted families in constructing latrines and in general house cleaning and improvement; constructed water pipe systems, playgrounds and cemeteries; and taught women knitting and macrame for income generation.	Large
Rural Public Health 518 A3	1978-79	Project focus was community health with emphasis on maternal/child health. PCVs planned and constructed latrines and coordinated and developed potable water systems in communities. One community project received AID funds to develop a water and latrine project and a protein supplement project (rabbit and garden activities).	Large
Integrated Rural Development/Peninsula 518 A8	1978-79	PCVs involved in revising first aid training and teaching primary school children about personal hygiene. They conducted soil fertility profile for irrigation scheme.	Large

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Ecuador (continued)			
Special Assignment 518 B6	1978	PCVs worked in National Park Development; conducted fact finding field trips to outline and support with scientific data the area's potential for water production and control; studied soil stabilization and environmental stability; provided guidelines for Ecuadorian Park Planners in carrying out national land use plans; promoted environmental education.	Large
El Salvador			
Urban and Municipal Government	1974	PCVs designed and constructed roads, water systems, and schools.	Small
Resource Management/ Agriculture Production	1978-79	PCVs involved in both research and extension including data collection and analysis, development of recommendations on watershed management and soil conservation, promotion of soil conservation practices, development and construction of soil conservation structures, management of small trials on farms.	Large
Guatemala			
Health Education	1964	PCVs organized groups to help themselves (e.g., 4H) in programs of environmental sanitation, nutrition, and home economics.	Medium
Municipal Development	1971	Teams of PCV architects, engineers, and public administrators drew master plans for cities. Immediate projects involved the design of public buildings and drains.	Medium
Irrigation Development--Rio Itriguis E-3-1	1975	PCVs designed and constructed system of canals for irrigation and drainage.	Small
Rural Infrastructure Development 520 A1 MU# W-1-5	1977	PCVs constructed and rebuilt simple water systems, small bridges, dams, farm roads, health centers, potable water systems, and latrines. They trained health technicians.	Small

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Guatemala (continued)			
Community Health 520 A4 MU# H-3-4	1977-present	PCVs provide instruction on sanitation; improve community social and economic conditions; assist in agricultural production and marketing; participate in CD projects; provide inservice training for health promotors; provide health education; and train midwives.	Medium
Public Health Nutrition; 520-B1	1977-82	PCVs involved in nutrition, with some education in hygiene provided.	Small
Potable Water	1977-present	PCVs train counterparts in planning, designing, and constructing potable water systems; supervise construction; prepare budgets and feasibility studies; do topographical studies; and install water systems and latrines.	Medium
Conservation of Natural Resources 520 A2; MU# A-1-1	1977-79	Project goals were to increase new forest areas, improve beneficiary incomes, and maintain natural ecosystems of small plots.	Large
Honduras			
Municipal Development 522 A4 MU#'s: 1977 E-1-5 1974 E-2-1	1974-present	PCVs design water systems and give engineering and technical assistance to small municipalities: design and supervise intallation of drainage and sewage systems; construct access roads, streets, markets, and schools; supervise construction of rural health posts; and design and supervise construction of irrigation projects to provide rural farmers with water during the dry season.	Medium
Municipal and Regional Planning	1976	PCVS provided technical assistance in development planning for municipalities including designing sewage disposal system; doing feasibility studies for new potable water systems; and doing impact study for dredging canals.	
Urban Development and Public Works	1976		
MU# P-2-5			

[NOTE: In 1978, Rural and Civil Engineering; Municipal and Regional Planning; and Urban Development and Public Works were combined into Municipal Development.]

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Honduras (continued)			
Irrigation 522 B9	1977-present	PCVs work with small farmers collecting/analyzing water data for design/construction of appropriate irrigation. PCVs (1) evaluate data on soil analysis, rainfall records, soil/water/plant relationships; (2) determine most adequate irrigation systems; (3) design small irrigation systems; (4) supervise construction of systems; and (5) assist in running system efficiently.	Small
Public Health 522 A1 MU# P-2-4	1976	PCVs acted as health promotors working in rural areas on water and sanitation projects; constructed latrines and wells; and trained village health workers.	Medium
Health Promotor Training and Supervision MU# T-1-4	1976	PCVs trained community health workers.	
Watershed Management 522 A8 MU# C-1-1	1977	PCVs participated in establishment and implementation of long-range programs to solve critical water supply and soil erosion problems; worked with hillside villages in agroforestry; trained local people in soil/water conservation, collecting data on runoff, and reforestation.	Small
Natural Resources Inventory 522 C6	1978	PCVs collected, field checked, and analyzed basic information on soils, water, vegetation, and actual and potential land use.	Medium
Jamaica			
Agricultural Extension 532 A1	1978	PCVs implemented plans to bring unused land into production through terracing, irrigation, and drainage.	Large
Forestry 532 B0	1978	PCVs encouraged improved management and continued expansion of national forest resources to ensure availability of essential raw materials and to maintain quality of watershed.	Small
Soil Conservation/Agro-Forestry	1982	PCVs worked on watershed management to increase food production on hillsides with tree crop cultivation or forestry within appropriate systems of soil conservation on a watershed basis.	Medium

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Nicaragua			
Potable Water Promotion MU# A-1-1	1970-74	PCVs worked toward increased production level of basic grain crops for domestic consumption.	Small
Health Education MU# D-3-3	1972-74	PCVs provided health education programs in rural communities; organized clubs of women and children to carry out programs to educate mothers and children concerning nutrition, child care, personal hygiene, and environmental sanitation.	Medium
Paraguay			
Environmental Sanitation 526 A2 MU# K-3-4	1968-present	PCVs work to decrease morbidity and mortality rates by reducing incidence of parasites from contaminated water sources and unsanitary waste disposal. They instruct the community as to the relation between proper sanitation and disease control. PCVs conduct house to house inspection of water sources and sanitary facilities; maintain and repair wells and latrines; work on protection of natural water sources; promote planning, financing, construction of running water systems; install water pumps; construct latrines; encourage excavation of trash pits; provide education through home visits, classes; train and provide auxilliary sanitary inspectors to rural health centers; and initiate projects for sanitary waste disposal, purification of existing water supplies, and development of new water supplies.	Medium-Large
Health Education MU# F-2-4	1968-79	PCVs worked as health educators in rural health centers. Became part of Environmental Sanitation and Rural Health in 1979.	Medium
Rural Health Project 526 A9	1979-present	PCVs improved low-cost rural health delivery services; promoted improved health practices and understanding through schools, community organizations, and health centers; were involved in construction of latrines and wells; and were involved in sanitary waste disposal.	Medium

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Peru			
Irrigation/Water Systems MU# A-7-6	1974	PCVs performed studies and analyses to complement crop goals set by Ministry of Agriculture and to recover soils lost to salinity and swampland in the coastal areas.	Small

PEACE CORPS
PROJECTS WITH WATER OR SANITATION ACTIVITIES, 1970 through 1982

NORTH AFRICA/NEAR EAST/ASIA/PACIFIC (NANEAP) REGION

Countries included:

North Africa:
- Morocco
- Tunisia

Near East:
- Afghanistan*
- Oman*
- Yemen

Asia:
- Malaysia
- Nepal
- Thailand

Pacific:
- Fiji
- Kiribati
- Micronesia
- Philippines
- Solomon Islands
- Tonga
- Tuvalu
- Western Samoa

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*Peace Corps is no longer active in these countries.

PEACE CORPS
PROJECTS WITH WATER OR SANITATION ACTIVITIES, 1970 through 1982
North Africa/Near East/Asia/Pacific Region

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
NORTH AFRICA			
Morocco			
Ag/Engineering/ Irrigation 378 B1	1978	PCVs designed and constructed diversion dams and canals; provided potable water to rural villages; provided irrigation water; surveyed for water supply routes, sewer lines, bridges and dams.	Small
Rural Water Supply Project 378 A1	1978 and 1982 (Tried twice)	Project focused on water system rehabilitation, sanitation, education. PCVs were involved in well designing; relining, rebuilding of curbs, aprons, rain catches, laundry troughs; waste water disposal; improvement of well and spring water quality. They supervised building of retaining walls for water collected from springs; supervised vector eradication, waste disposal. Also participated in yearly programming of Ministry of Health, Provincial Office.	Large
Rural Sanitarians 378 A1	1978-80	PCVs worked in health education, improvement and maintenance of public water sources, and sanitation. They inspected wells and cisterns in rural areas, saw to well chlorination, and trained counterparts in basic sanitation and laboratory analyses.	Small

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[1] Projects before 1978 were categorized in Management Unit Numbers (MU#).

[2] For the most part, year(s) shown indicate year(s) researcher found written documentation on a project. Seldom was there an indication of beginning and ending dates.

[3] In the research data, sometimes only project goals are mentioned and activities are implied; in other instances, PCV activities are given and therefore the project goals are implied.

[4] Project size is indicated as follows: "Small" represents under 5 volunteers; "Medium," 6-12; "Large," 13 or more. Number of volunteers varied from year to year, therefore this label indicates an average.

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Tunisia			
Wells Rehabilitation (Potable Water) 364 A-2	1972-81	PCVs worked with CARE as well construction supervisors and health educators on the importance of clean water supply. They renovated and reconstructed open wells--deepening, cleaning, casing, and capping to transform each site into a closed system providing cleaner drinking water. Female health educators introduced public health measures.	Medium
Wells/Latrine Education 364 A2	1978-present	PCVs are assigned to existing water wells refurbishing team to refurbish 25-30 high-use public wells; to create viable maintenance teams; to train masons in well construction; to initiate/assist in latrine construction; to provide impetus for formation of health education/wells maintenance teams. PCVs work as health educators to establish working relationships with existing health professionals; recruit and train new health workers; provide health education to rural communities, especially in the area of water and water-borne disease; retrain current rural health workers.	Small
NEAR EAST			
Afghanistan			
Health	1970-72	PCVs assisted Afghan Family Guidance Association in establishing provincial clinics. Supplying potable water to villages was task of three volunteers working with mobile teams.	Small
Rural Infrastructure Development 376 A4	1978	The PCV provided engineering and construction supervisory expertise (including irrigation structures).	Small
Oman			
Water Sanitation 381 A6	1980-82	PCVs constructed either dry pit latrines, bucket flush water sealed privy, tank flush or flush toilets. Project being phased out.	Small

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Yemen			
Haima Small Dams Project	1974-75	PCVs improved irrigation system to boost coffee-growing capability.	Small
Rural Water Supply/Well Drilling/Small Water Projects 022	1973-78	Project goals were to provide supply of ground water to villages and train Yemeni counterparts to operate and maintain drilling rigs and village water systems.	Small
Construction Design and Engineering 379 B3	1978	PCVS constructed water-storage tanks, provided technical expertise in design and construction of public projects: buildings, streets, parks, water and sewage systems.	Medium
CRS Small Rural Water Projects	1983-present	One PCV functions as a project officer in charge of the planning and implementation of water projects.	Small
Rural Health Clinics 379 A3	1978-81	PCVs provided health and sanitation education, encouraged self-help projects, cleaned water supplies and cisterns.	Medium
Rural Development/Small Water Projects 379 A1/044	1981-present	Project designed to provide sources of safe, potable water. PCVs construct spring boxes and elevated water tanks with gravity-feed distribution systems, train counterparts, maintain water systems, and educate about water-borne diseases. In some instances, the new technology of shotcrete has been used in the construction of water tanks.	Medium
Local Resources for Development 379 B5	1980-present	PCVs plan, design, and construct water projects, schools, and clinic housing.	Medium
ASIA			
Malaysia			
Water Resources and Sanitation 483 B2	1978		
Sabah Health 483 A4	1978-79	PCVs assisted in the construction and design of major irrigation schemes including dams, tertiary irrigation systems, and canals; and developed flood control and forecasting capabilities for the Malaysian Peninsula.	Medium

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Nepal			
Community Water Supply 367 A1 MU# R-4-1	1971-present	The goal is to lower infant mortality and improve health by providing safe, sanitary drinking water. In the rural construction program, PCVs survey, design, and oversee construction of drinking water projects; train counterparts to use hydraulic ram pump; establish national water supply maintenance program; survey, design, and construct rural bridges. PCVs survey, design, and construct drinking water supply schemes in remote areas; train counterparts. From 1971 through 1982, 125 PCVs surveyed, designed, and oversaw the construction of 80-100 rural drinking water projects reaching an estimated 75,000 people. Very successful.	Large
Rural Suspension Bridge 367 A8	1975-present	PCVs improved transport and communication facilities of remote village areas by providing safe, long-lasting suspension bridges.	Medium
Hydraulic Ram Development	1978-present	PCVs survey projects and construct hydraulic rams; work on site identification and survey, design, and installation of hydraulic rams in rural mountain areas where water sources are at lower elevations and alternate energy forms are not available. Potential impacts include increased sanitation, personal health and safety, and therefore life expectancy. Another major impact is reduced infant mortality.	Small
Resource Conservation and Utilization 367 A6/9 Soil and Water Conservation MU# S-6-1	1981-present 1976-78	Under Soil and Water Conservation, PCVs have functioned as educators, guides, and advisors at village level on complex soil and water conservation problems. They have improved management practices to yield more water from springs, more food from land, and more fuel from forests. Focus on conservation education, seed collection and nursery development for forests, survey of watershed areas, and construction of dams. Phased into Resource Conservation and Utilization, PCVs are now involved in conservation education for communities, training of community foresters, and design and implementation plans for reforestation and protection of existing forests. PCVs implement soil, fodder, forestry, water, horticultural, and conservation education projects.	Medium

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Nepal (continued)			
Minor Hill Irrigation 367 C1	1982-present	PCVs survey, design, and construct small hill irrigation projects to supply water to areas of 50 hectares or less as part of rural integrated development project.	Small
Thailand			
Malaria Eradication Project 493 A2	1962-present	Since 1962, PCVs have surveyed and eradicated malarial mosquito breeding sites, and sprayed houses near such sites.	Medium
Agriculture/Rural Public Works Project (became WRD)	1969-75	PCVs worked to raise farmer incomes by assisting the Community Development Department to improve water resources by developing infrastructures--spillways and dams. They designed and conducted preliminary surveys and site checks, supervised construction, and trained counterparts.	Large
Water Resources Development 493 A7 MU# A-2-1	1975-present	This large infrastructure development project has focused on small dams, spillways, and irrigation canals. To date PCVs have surveyed and designed 350 projects, supervised construction of 105 projects, increased irrigable farm areas to 210,000 acres affecting 21,000 farm families, and conducted counterpart training.	Large
Land Development Project	1970-78	PCVs developed and improved water resources for irrigation to counterbalance low rainfall levels.	Medium

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
PACIFIC			
Fiji			
FAO	1970	PCVs supervised irrigation scheme.	Small
Rural Community Development 411 A3	1970-present	PCVs involved in small projects development --building bridges, sea walls, community halls, appropriate technology projects; development and repair of rural water systems. Successful.	Large
Public Works, Rural Development	1972-present	PCV hydrologists, surveyors, and architects advise and train Public Works Department members. Successful.	Small
Natural Resource Conservation and Development 411 A7	1978-present	PCVs demonstrated effective use of indigenous and introduced resources in terms of local consumption and exports, did land use planning, assessed environmental damage and prepared guidelines for protection, e.g., marine resources.	Large
Health 411 A1	1979-present	PCV health educators and sanitarians improved sanitation and potable water supplies.	Medium
Kiribati			
Village Health/ Village Health Aides, 441 A4	1982-present	PCVs work with communities on clean water, adequate sanitation, and proper nutrition.	Medium
Rural Construction/Construction Aides, 441 A5	1982-present	PCVs survey and supervise construction and maintenance of seawalls, causeways, and roads.	Small
Micronesia			
Civil Engineering & Surveying Services MU # B-1-5	1966	PCVs provided technical assistance to municipalities for construction of dispensaries, water seal toilets, and classrooms.	
Health Education 401 G9	1978	PCVs designed, developed, and implemented health education materials; trained teachers; trained cooks, mothers, and villagers in general on nutrition, child care, and sanitation.	Large

Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Micronesia (continued)			
Village Development, 401 H8	1978	PCVs constructed seawalls and water catchments and surveyed water resources.	Medium
Environmental Sanitation 401 B8	1979-present	PCVs analyze current water systems; upgrade water quality and quantity; educate community regarding water use and conservation; and train water treatment plant operators.	Small
Economic Development 401 H9	1979	PCVs taught business principles: accounting, bookkeeping, etc., and trained counterparts for construction projects including water wheel power systems.	Medium
Philippines			
Nutrition/Community Development 492 A1	1978	PCVs worked on developing potable water systems.	
Health/Community Development 492 A 2/1	1978-present	PCVs developed potable water systems at eight sites (community provided labor--PCVs linked resources); constructed outhouses and water-sealed toilets.	Large
Local Development Administration	1978-present	One PCV specialized in environmental sanitation, building potable water wells and water-sealed toilets. Ten helped improve village water systems. (Canadian Environmental Sanitation Project dug 100 wells.)	Large
Uplands/Community Development 492 D0	1982-present	PCVs assist Uplands communities in design and construction of sanitary water systems; design, drill, and supervise construction on the most appropriate type of water system for that area; design and build a spring box and water delivery system; drill for artesian water or set up a pump for ground water to serve 50 families.	Small

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Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Philippines (continued)			
Accelerated Impact Program APN 498-C256	1981	AID funds for PCVs: 81-02 Irrigation 81-03 Sanitation 81-05 Water Wells 81-11 Potable Water System 81-12 Potable Water Source 81-18 Potable Water System 81-20 Potable Water System 81-21 Spring Development 81-32 Potable Water System 81-02 (a) Irrigation System 81-37 Municipal Water Works 81-42 Wells Project 81-43 Water System 82-47 Hydraulic Ram Project 81-49 Jetmatic Pump 81-52 Water System Project 81-53 Water System Project	
AG Production 492 C5	1981-present	PCVs assist with development of irrigation systems.	
Soloman Islands			
Water Resources Development 431 B2	1982-present	Goal is to provide adequate reliable supplies of potable water. PCVs survey village water needs, plan work schedules and material requirements for building water system; supervise and assist with installation; train villagers in maintenance and repair of system.	Small
Tonga			
Village Water Supply 421 A2	1979	PCVs built concrete water cisterns to provide water to approximately 30 villages; travelled from village to village to modify cistern designs, select and survey sites, recruit/organize village labor; and constructed rain roofs.	Small
Technical and Community Services 421 A7	1982-present	PCVs work in water and sanitation and water project management.	Large
Health Education 421 A4	1982-present		

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Project Name and Number[1]	Year(s)[2]	Project Goals/Activities[3]	Size[4]
Tuvalu			
Rural Island Development 442 A1	1980-present	PCVs developed water catchment system. Very successful.	Medium
Western Samoa			
Public Works Development 491 A4	1979-81	PCVs mapped and redesigned rural water supply system; trained Samoans in water supply construction. Successful.	Small
Water Resources Development 491 A4	1975-present	PCVs (engineer, construction supervisor and store manager) assist Public Works Department in improving existing and constructing new water supply systems. Most systems are surface water gravity-fed, with lesser importance on pumped groundwater and rainwater collection systems. In recent years there has been a shift in emphasis to conservation and maintenance as opposed to new construction. The kind of PCV requested has shifted from skilled water engineer to skill-trained generalist technician. Successful project.	Small

SOURCES OF INFORMATION

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    Kathy Judge, Resource Development Specialist

Jim Bell, Water/Sanitation Sector Specialist, Office of Training and Program Support

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Peace Corps Information Services Division
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    Rex Costanza, Chief, Management Information Division
    Dick Haag, Evaluations Specialist

Yvonne Vaughan, Chief of Volunteer and Staff Payroll Services

Genoa Godbey, Chief, Paperwork and Records Management

Craig Hafner, Senior Project Officer, WASH, former Peace Corps Water and Sanitation Sector Specialist

Arlene Mitchell, Chief of Operations, Africa Region

George Evans, Chief of Operations, Inter-America Region

Country Desk Unit Staff Interviewed*

Africa Region

Mauritania, Senegal, Sierra Leone, (Ivory Coast):	Elena Hughes, CDO; Susan Payton, CDA
Liberia, The Gambia:	Theresa Joiner, CDO
Mali, Niger, Upper Volta:	Steve Reed, CDA
Zaire, Rwanda (Chad):	Kay Kennedy-Roberts, CDO
Botswana, Lesotho, Swaziland:	David Browne, CDO
Togo, Benin, Ghana:	Gary Laidig, CDO; Marcia Daigle-Zai, CDA (1982)
Kenya, Seychelles, Malawi, Tanzania:	Julia Escalona, ACDO
Cameroon, Gabon, Central African Republic:	Paul Rowe, CDO; Susan Baity, CDA

Inter-America Region

Honduras, Guatemala:	Dexter Katzman, CDO; Yvonne Austin, CDA
Jamaica, Eastern Caribbean, Belize:	Eugene Rigler, CDO
Colombia, Paraguay, Dominican Republic:	Noreen O'Meara, CDO

NANEAP Region

Morocco, Tunisia:	Bill Dant, CDO, Robert Phillipson, CDA
Fiji, Western Samoa, Tuvalu:	Steve Prieto, CDO; Phyllis Jones, CDA
Nepal, Oman, Yemen:	Susan Belmont, CDO; Chris Pelton, CDA
Malaysia, Thailand:	Edward Geibel, CDO
Micronesia, Solomon Islands, Tonga, Kiribati:	Lisbeth Thompson, CDO; Martha Kichorowsky, CDA
Philippines:	Melanie Williams, CDO

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*Abbreviations Used:

ACDO, Acting Country Desk Officer
CDO, Country Desk Officer
CDA, Country Desk Assistant

APPENDIX C

SAMPLE

PEACE CORPS WATER/SANITATION SURVEY QUESTIONNAIRE

This survey was used for information gathering
in Phase III, Case Studies Draft,
of the Peace Corps Water/Sanitation
Case Studies and Analyses contract.

Creative Associates, Inc.

Contract no. PC-382-1005

PEACE CORPS WATER/SANITATION SURVEY

This is a sample of the survey used in researching the five case studies. It was sent to former Peace Corps Volunteers and staff whose names were provided by the Country Desk Unit or other Volunteers.

Name ______________________________

Project involved with __________________ Years _______

Current position __________________________________

Project Description

1. Describe your project goals as you understood them.*

2. Describe beneficiaries of project activities in cultural/socioeconomic terms (men/women/children, urban/rural, level of income/education).

3. Describe your role/activities.

4. How many PCVs were involved in the project?

   Male _______ Female _______

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* Use the back of the sheet for any answers needing more space.

5. Were there counterparts? ☐ No ☐ Yes How were they selected? Describe roles and benefits.

6. Was your project mostly local

	No	Yes
Labor	☐	☐?
Materials	☐	☐?
Technology	☐	☐?

7. Were water/sanitation activities integrated with other project activities?

☐ No ☐ Yes Please describe.

PEACE CORPS WATER/SANITATION SURVEY

Project Design

8. Who planned Peace Corps water/sanitation activities by project?

   ☐ APCD/Program Manager--which one? ____________________
   ☐ Ministry--which one? ____________________
   ☐ PVO--which one? ____________________
   ☐ Community
   ☐ Other ____________________

9. What were the short term effects of the project?

   What were the long term effects?

10. Were community members involved in ☐ planning and/or ☐ carrying out the project? How?

11. How were women involved in or affected by water/sanitation activities of your project?

PEACE CORPS WATER/SANITATION SURVEY

Training and Information Exchange

12. Were you satisfied with the Volunteer recruitment/selection process?

    ☐ No ☐ Yes Please explain.

13. Describe essential components of Peace Corps training before and during service (technical, cross-cultural, language) in terms of whether they met Volunteer project/incountry needs? What was useful? What needed improvement--why/how?

14a. Were there job related workshops or conferences during implementation of the project? Organized by whom?

☐ PC Staff

☐ PC Volunteers

☐ PC Region

☐ Ministry Which one? ________________

☐ Other ______________________________

☐ None

14b. Were they useful? ☐ No ☐ Yes Please describe.

15a. Did PCV support (transportation, site visits, information, funds) from Peace Corps staff in country meet PCV expectations?

☐ No ☐ Yes Please explain.

15b. from Washington? ☐ No ☐ Yes Please explain.

15c. from host country ministry or collaborating agency? ☐ No ☐ Yes Please explain.

15d. from the community? ☐ No ☐ Yes Please explain.

16. Did the water/sanitation roles require Volunteers who were

☐ trained by a profession,

☐ skill trained by Peace Corps,

☐ both?

Results/Effects

17. Describe project accomplishments.

18. Was the project self-sustaining when Peace Corps Volunteers left?

☐ No ☐ Yes

Who assumed responsibility for ongoing activities?

19. Were there any Peace Corps water activities in ________ (country) which promoted local economic development, e.g.:

☐ food production (irrigation),

☐ energy (water wheels, dams),

☐ skill training of host country nationals to be used for further employment,

☐ institution building (training counterparts, building administrative or management skills),

☐ other

☐ none?

Please describe.

20. Is/was the ________ (country) Government/community satisfied with the project?

☐ No ☐ Yes How do you know?

PEACE CORPS WATER/SANITATION SURVEY

Lessons Learned

21. Could the project be replicated in ____________ or other countries?
(country)

☐ No ☐ Yes
Describe the situation where the project would be most likely to succeed (geography, organizations, culture, support structures).

22. Describe any problems encountered with the project and if/how they were solved.

PEACE CORPS WATER/SANITATION SURVEY

23. Describe successes--give country specific as well as general reasons for.

24. Lessons learned, suggestions, recommendations for future water/sanitation activities.

Personal Impact

25. Were you satisfied with your job and contribution to __________ ?
(country)

☐ No ☐ Yes Please explain.

26. Did your Peace Corps experience have a positive effect on your personal development? ☐ No ☐ Yes Please explain.

27. Did your Peace Corps experience have a positive effect on your professional development? ☐ No ☐ Yes Please explain.

28. Did you gain specific knowledge in your Peace Corps experience which you have applied in your work since Peace Corps? ☐ No ☐ Yes
If yes, what?

29. Do you share directly or indirectly with your colleagues or community what you gained in your Peace Corps experience? ☐ No ☐ Yes
If yes, what?

30. Do you correspond with people in your host country? ☐ No ☐ Yes

31. Are you still involved with international development in any capacity?

☐ No ☐ Yes

If yes, is it in the water/sanitation field? ☐ No ☐ Yes

32. Any other comments are welcome.

33. If you know of people who would be useful information resources on Peace Corps ____________ water/sanitation activities, please list their names
(country)
and addresses/telephone numbers.

Thank you for your contribution in time and experience.

Date completed and mailed: ____________________________.

Using the enclosed envelope, please return to Donna Frelick, Coordinator, Information Collection and Exchange, U.S. Peace Corps, 806 Connecticut Avenue, Room 701, Washington, DC, 20526, U.S.A.

PARAGUAY CASE STUDY APPENDICES

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APPENDIX D.1

FIVE STEPS TO ESTABLISHING A WATER SUPPLY SYSTEM*

1. Visit to the Community by Project Staff

Discussions are carried out with the village leaders, in which their interest in a water supply and sanitation program is explored.

If an interest is manifest, a meeting of the official and informal community leaders, including the teachers and the priest, is arranged at the date and time that is most convenient to them. At this first meeting, the basic needs of the village are discussed. If the community leaders indicate that water supply and sanitation have a high priority, they are informed how, with some technical help from the government, the community can solve some of its own problems.

In addition, they are shown the necessity of certain studies: a study of their community, a socioeconomic survey, and topographic mapping. The first study can be carried out by themselves; the second, by themselves with the help of technical specialists; and the third, by the technician (sanitarian) with their help.

2. Community Surveys

The leaders meet in groups of eight to ten persons and plan the best way to carry out the surveys.

Often such surveys have already been carried out by other organizations, and at times those done by villagers are not perfect; however, what is important is the population's participation in defining its own problems.

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*Cardenas, Margarita, "Rural Water Supply and Sanitation Education in Paraguay," reprinted with permission from Assignment Children, UNICEF, Issue 45/46, Spring 1979. Copyright UNICEF.

Self-study by the Community

The aspects which are surveyed are the area, its characteristics, and facilities; transportation; the villagers' social and cultural specificities; educational and recreational facilities; the number of households or facilities with electricity; beliefs, taboos, religion, economic status, literacy level; needs of the community; attitude of the people towards water, excreta, and garbage; resources of the area, harvest seasons, etc.

The results of this study are distributed among the village elders.

Socioeconomic Survey

The leaders select 20 agents, generally students or persons who can read and write, for whom they organize a training session on how to carry out a survey. Questionnaires and a map showing housing locations are distributed. A date and time are set for the survey, usually a Saturday or Sunday. The local leaders are notified. The villagers are informed in church, and the students at school, as to the day and time of the survey, and the necessity for the heads of families to be present. Each survey agent visits 20 houses and generally ends his work in one day. The agents then meet to tabulate the results and correlate them with the house locations. Finally, the leaders meet to analyze the tabulated results and send them to SENASA.

Topographic Survey

This survey is carried out by a student engineer with the villagers' help.

3. Creation of an Operational Infrastructure

An Organizational Committee to Oversee the Project

If the population is interested in sanitation and especially in a water supply, and if the studies demonstrate that one is really necessary, an assembly is called of all the leaders, representatives of organizational groups, and heads of families. At this assembly, the project is discussed with the villagers, an approximate budget is established, and possible sources of funds are identified. A committee of seven to nine members is nominated by the villagers to be responsible for the planning of the project and the mobilization of the villagers.

An Official Water Board

When the construction of the water source has been terminated, the villagers meet again. At this meeting, the outgoing committee reports on the aspects already finished, and presents a statement of accounts and the plans for the completion of the village water supply project, with a proposal for its financing.

An official Water Board is established, which has its own statutes and is recognized by law. Its members are elected at this village assembly: five are from the main community, and four are from the peripheral, more dispersed areas. Its main aim is to solve the environmental sanitation problems of the district, especially those of water supply and excreta and solid waste disposal.

4. Promotion of the Project by the Water Board

The water supply program for a rural community is "dynamic-progressive" and is envisaged over a 20-year period. The villagers carry out the construction by stages: a) construction of the water source; b) construction of the water storage facilities; c) installation of the pump equipment; d) construction of the pipe network; e) installation of house connections; and f) operation, maintenance, and repairs.

At each of these stages, certain promotional activities are planned. The following are some of the most important ones.

- Meetings with leaders of community organizations. The members of the Water Board establish contact with the leaders of other organizations in the community, such as the 4-H Club, the Municipal Council, the Rural Extension and Public Works services, religious organizations, the health center, Mothers' Club, etc., in order to inform them about the project and discuss the way in which activities can be coordinated.

- Contacts with owners of commercial establishments, farmers, and persons with financial resources. These are informed about the project and their help is solicited in order to lower the cost to the community.

- Contact with the association of village members living in Asuncion. These associations, for example, the "Organization of Guarambenos residing in Asuncion," help to arrange contacts with other persons and aid agencies, help with fund-raising, and serve as a liaison between SENASA and the Water Board. In some cases, villagers residing in other countries collaborate, e.g., people from Villetano living in Buenos Aires.

- Meetings with other organized village groups. Meetings with small groups are held in order to provide information about the project, overcome any possible resistance to it, and coordinate joint actions.

- Neighborhood assemblies. The Water Board convenes an ordinary sessions once a year, or special sessions, as specified in its statutes. The Board agenda comprises election of new members, reports on finished projects and future plans, presenting account statements, etc.

- Creation of support groups. To carry out the project, a large number of persons are involved according to their capacities and abilities. The assignment of specific responsibilities is therefore necessary. Consequently, the following committees are formed: a fund-raising committee, a committee to organize the work teams, and a committee for information and motivation. These committees deal with the evaluation, planning, and implementation of specific activities, acting in full agreement with the Water Board, which supervises and coordinate their activities.

- Meetings with school teachers. The teacher belongs to the community and is a leader acknowledged by everyone. For that reason he should be involved from the very beginning. The aims of the project and the importance of his active participation, the great value of the water supply and sanitation project to the village, and the necessity for the children to participate in this experience are all explained to him.

5. Implementation of the Program

Management of Contributions

The Water Board manages all contributions in cash, labor, equipment, tools, transport, land, foodstuffs, and other inputs by the community.

Signing of Agreements and Contracts

The Water Board can sign agreements or contracts with the government and any other organization or person for the construction work.

Selection of Village Technicians

The Water Board, together with SENASA, selects persons who, after training, are responsible for the installation of the piped network, its operation, and maintenance.

Administration of the Works

The Board is in charge of the system's administration within the framework provided by SENASA.

Inaugural Activities

Inaugural activities in the presence of the population and government authorities mark the beginning of well drilling, the erection of the water storage tank, or the laying of the first pipe, and then, finally, the start of operations.

APPENDIX D.2

PROJECT DESCRIPTION*

Latrinization of Compania Curupayty, 1975-76

I. Curupayty

A Sanitation Inspector and a health educator Volunteer chose to do a latrine project in Curupayty because the director of the school there had asked for their help, offering her full support and that of her teachers and students. She was extremely preoccupied by the symptoms of parasitosis present in her students and by the lack of sanitary latrines in the homes of her students. The following is the Volunteer's report.

We began the project with a meeting at the school with all of the parents of the students in attendance. We spoke of the problem of parasitosis, how parasites, especially anquilostoma, are acquired, and how they affect a child. Then we described the ways in which the parasite cycle can be broken and presented our project to them. We had, from the health center, acquired large quantities of parasite medicine (tetracloroetiline and piperazine) and we said that we would give this to the children of anyone who could show us that they used a sanitary latrine. There followed a short talk concerning the methods to be used in building a sanitary latrine and how they could bring the latrines they had up to standards.

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*Catherine Dick, PCV, and Felix Villar, SENASA Inspector.

It was arranged that the students would advise the director when they wanted us to make a home visit to inspect their new or rebuilt latrines. The support that we recieved from the director and her teachers surpassed our greatest expectations. Once a week we reported to the school and there was usually a list waiting for us and a student would accompany us on the visits. The director and teachers made many visits too when they felt that response had fallen down.

We visited around 50 families and gave medicine to 190 children over a seven-month period. Curupayty is a large *compania* (rural district) and the houses are greatly dispersed. We usually managed to do three to four home visits in a morning. Sometimes, if families we had to visit lived very far from the school, we would find two horses waiting for us at the entrance to the *compania* when we got off the bus. Of course, sometimes bad weather made it impossible to make visits.

It is important to discuss the medication program that we had and what we hoped to accomplish with it. The administration of parasite medicine to the children probably freed them of parasites for a while, but, without a doubt, they will become infested again before long. Such a program has little value in this sense unless it is continued for years and unless an area can be completely sanitized. The real value of this medication, I feel, was in its use as an incentive to parents to sanitize the environment in which their children lived. It was also a good method of making them aware of the parasitosis problem and of the ways of combatting it.

II. Calle Poi

We chose to work in this *compania* because of the presence there of a club for housewives (*Club de Amas de Casa*) which had been formed four years earlier by the Home Extensionist of the Agricultural Extension office in Yaguaron. She had made great progress in the areas of nutrition and home improvement and expressed an interest in our program.

In this *compania* we had ten *losas* (latrine floors) delivered to the house of the club leader. These were obtained through the Ministry of Health and were sold to the members of the club on a quota basis. We used the same work methods which we had used in Curupayty; lists of families to be visited were submitted at club meetings and we were accompanied on these visits by a club member. When we had visited all of the members we began to visit other families who had been recommended to us by various members. We made some 50 house visits over a five-month period and gave medicine to 100 children.

III. Comments

I cannot stress enough the importance of working through an organization (such as the above) or an institution (such as the school) which exists in a given area. The support which we received from these people made the realization of the projects much easier. We were well accepted in the homes we visited because the people knew of us and we had been able to convince them of the importance of our projects through educative talks given at club meetings (or at the school, as in Curupayty) before we ever arrived at their houses.

I have worked very closely with the Home Extension Agent of the SEAG (Ministry of Agriculture's Servicio de Extension Agricola-Ganaders) office; also with other clubs she had organized in the companias. She has to devote part of her program to health education and I was able to help her fulfill her work commitment while fulfilling my own.

IV. Projected Latrine Project for 1976

This year we have decided to work closely with some newly-organized clubs of the Home Extensionist. There are four companias in which we will be working.

Since we helped organize these clubs we have been able to use the first meetings to promote interest in our program through the use of educative talks. Thus, our sanitation program, which includes latrines, water, garbage disposal, household pest control, and health education in general, is combined with SEAG programs of nutrition and home improvement to provide a well-rounded attack on all health problems which exist in these rural areas.

1979 VOLUNTEER ACTIVITY SURVEY

Paraguay is the only country in these case studies in which the VAS results are noted because of the particular significance they hold in demonstrating the reversal in the Environmental Sanitation and Health Education Projects. Paraguay was also unique for having the highest response rate of all Peace Corps countries (94 percent) and the highest number of female PCVs (80 percent).

Environmental Sanitation: Most of the 15 respondents to the questionnaire felt their actual work objective matched the official one. Only half felt consideration had been given to the project's impact on women, but this was 15 percent higher than the average for the country. Eight of 15 felt their project was integrated with the development efforts that were going on in Paraguay. Eighty-seven percent said they were using mostly local resources and five reported collaboration from bi- and/or multinational agencies. A majority said the effects of their project would be lasting and continue when Peace Corps was no longer involved. Eleven felt their work was very useful for development. Recipients served were mostly under 16 years of age or over 45, 68 percent were women, and they were primarily in the bottom 40 percent socioeconomically in Paraguay. Only one Volunteer considered terminating early. The host country friendship index for Volunteers in this project was 42 points higher than the country average; however, the work satisfaction index was 29 points lower than the country average.

Health Education: Four of four Volunteers responded. Three of the four were living in a place with a population under 10,000. All felt much consideration had been given to the project's impact on women and that the project was integrated with other development efforts in Paraguay (double the country average in both categories). Two said they were using mostly local resources and one of the four reported collaboration with bi- and/or multinational agencies. Two thought it was likely the effects of their project would be lasting and would continue when Peace Corps was no longer involved. Of beneficiaries of the project, 90 percent were under 16 years of age or over 45, and 74 percent were women. Three of the four Volunteers reported that their recipients were primarily in the bottom 40 percent socioeconomically in Paraguay. The host country friendship index was average for the country, but the work satisfaction index for the four was 44 points above the country average.

CONSULTANT ASSESSMENT--PARAGUAY 1981

A consultant assessment of Peace Corps' role in sanitation in Paraguay made in January 1981 reported a slight shift in PCV roles due to German, UNICEF, and World Bank efforts to promote more community water systems instead of individual ones. PCVs played more of a coordinating role with the community, Government, and other organizations as well as that of community motivator. Volunteers were assigned by SENASA and community projects were often selected by SENASA based on PCV recommendations. Local projects were the result of individual or local decisions. Project costs were paid through grants, matching loans, and individual contributions. Local payments were in kind and cash raised through various community activities. Operation and maintenance was through a community organization, "junta." Technical codes, rules, and guidelines were developed by SENASA and taught at the in-country training sessions. Though Volunteers felt the pre-service training course was good overall, they complained that there was too much technical training for the basic needs in Paraguay and too little hands-on training with indigenous materials.

Projects sponsored by the Government were relatively small, communal-type watering points. Groundwater was used with windmills as often as possible. Operation and maintenance of handpumps and windmills reportedly had not been good, possibly due to lack of parts and training. The report stated that project schedules were delayed due to uncertain road conditions, fluctuating availability of labor, and difficulties in obtaining materials.

In assessment of conditions and recommendations for appropriate technology at PCV sites, the consultant reported that most wells were hand dug and unprotected and should be covered and a handpump provided. The recommended interim solution was developing central watering points where the source was protected with distribution to be provided in the long run. At that time buckets were being used to draw water and it was recommended this be upgraded to "bailer" or handpump with windmills and electric pumps as options. At PCV sites surveyed there were no water distribution systems, no water treatment, and no storage facilities. Small storage tanks of steel or ferrocement at watering points and individual homes as well as drums and crocks were recommended for implementation. Most of the labor was voluntary, equipment was either furnished by outside sources or nonexistent, and projects were labor intensive. Cement, brick, thatch, and fired roof and floor tiles were commonly available.

APPENDIX D.5

1980-81 VOLUNTEER ACTIVITY SURVEY

Of the 15 Volunteers in the Environmental Sanitation Project in 1981, 13 responded to the survey. Six were considering extending and none was thinking of early termination. Eight felt their work was very useful for Paraguayan development. Six felt "well prepared" to do their job and five felt "positive" or "very positive" about their accomplishments. Five expressed above average job satisfaction and only two felt their accomplishment would probably have occurred even if they had not been involved. More than half of the Volunteers reported lack of materials limiting their work "a great deal."

Survey respondents rated in-service technical and cross-cultural training below the country average. Half the Volunteers wanted more technical training and wanted more training in Guarani. This project's ratings for PC staff support were lower than the country average. One fourth felt PC programming staff understood little of what the Volunteer's job would be and 62 percent felt the same about supervisors/counterparts. Two Volunteers were extendees. Three-quarters of them were placed in sites of under 10,000 population. The mean proficiency in Spanish was FSI 3+ and in Guarani the mean was 2.

Of the 27 Volunteers in the Rural Health Project, 93 percent responded to the survey. Eight were considering extending and two were considering early termination. Eighty-three percent felt their work was very useful for Paraguay's development. Ninety-five percent of the respondents used a host country language more than 50 percent of the time and 96 percent felt positive about Paraguayans.

Half the Volunteers felt "well prepared" to do their jobs and half felt "positive" or "very positive" about their accomplishments. Only three felt their accomplishments would probably have occurred even if they had not been involved. Forty-three percent reported lack of materials limiting their work "a great deal."

Volunteer rating of in-service technical and cross-cultural training was average for the country, but half wanted more technical and Guarani language training. One fourth felt PC programming staff understood little of what the Volunteer's job would be and one half felt the same about supervisors/ counterparts. This project rated PC staff support average for the country.

Only eight of these Volunteers were under 25 years of age and 20 were women. Two were extendees. Eighty-eight percent were posted at sites with population under 10,000. The mean proficiency in Spanish was FSI 3 with a 1+ in Guarani.

APPENDIX D.6

EVALUATION OF PEACE CORPS WATER AND SANITATION PROGRAM*

An August 1982 assessment of Peace Corps water and sanitation activities in Paraguay reported on projects under the MSPBS. At that time there were 11 Volunteers in the field.

The 11 Volunteers were programmed to work in small communities to promote the installation of piped water systems consisting of a drilled well with submersible pump, elevated storage tank, and distribution system with household connections. Four Volunteers, trained in Gallup, New Mexico, were working in central Paraguay where World Bank money was funding the piped water systems and UNICEF was supporting rural hand pump projects. Four Volunteers were located in the North where German Development Fund monies were supporting piped water systems. Three Volunteers were working in the South to promote piped water systems financed by Argentina.

Volunteer activities included:

- o community surveys;
- o construction of pit latrines including cement floors (locals expressed interest in learning to make the floors in order to be able to make and sell the floors for profit once the Volunteers left);
- o construction of home-made handpumps (two PCVs designed and developed their own designs using local materials; the technology for making, installing, and repairing the handpumps was being transferred so that, like the latrine floors, they could be made and sold locally);

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*Victurine, Ray; Consultant to PC/OTPS.

- capping of springs--construction of spring boxes or tubes to protect the source;
- reparation of existing wells through the introduction of covers, well heads, and improved extraction systems, including pump installation; and
- public health education regarding the connection between parasites, water resources, and hygiene.

Volunteer frustrations were noted by the consultant and several acute problems were identified.

- The PCVs did not enjoy working in the promotion of piped water projects. SENASA was under great pressure to complete the construction of their systems according to a timetable established by the international donors. SENASA, in turn, pressured the community and the PCV who involved himself in fund raising activities to spur the completion of the system. Fund raising was not perceived as a viable role by the Volunteer and was unfulfilling.
- PCVs felt that working with a SENASA inspector in an urban community resulted in a duplication of efforts; they were doing the work a SENASA inspector could easily do alone.
- Material support was promised but not forthcoming.
- Volunteers believed that their work would be more satisfactory in small rural areas rather than in larger communities.

SIERRA LEONE CASE STUDY APPENDICES

APPENDIX E.1

THE RURAL WATER SUPPLY SURVEY, 1977

What Was Surveyed. In order to make a comprehensive survey of all water supply schemes in Sierra Leone, it would be necessary to include all open and sealed wells, rivers, swamps, springs, water systems, handpumps, etc. However, due to the limited personnel and time involved, this survey was restricted to rural village handpumps, pumped-water systems, and gravity-fed water systems. The Degrement systems were not included in the survey.

By handpumps were meant small, single-person-operated handpumps capable of pulling water up from a well as shallow as ten feet and as deep as sixty feet. Pumped water systems are those systems that are supplied with water from a nearby well, spring, or river. The water is pumped by engine driven pumps to a storage tank and then fed to town standpipes by gravity. Gravity-fed water systems are those systems that are supplied by a water source that is higher than the town to allow the water to flow by pipe into the town by gravity. There are no pumps or engines involved in these systems.

Handpumps. It was found that of the total number of handpumps surveyed, 95 percent were located in the Southern and Eastern Provinces, while only five percent were located in the North. There were no handpumps surveyed in the Western area, Bombali, Koinadugu, or Kono District. Of all handpumps surveyed, 39 percent were located in the Kailahun District. This is due mainly to efforts of the Eastern Clinic at Mobai and its community development program which installs handpumps.

Of the 99 handpumps surveyed, 44 percent were working, while 56 percent were not. Nearly all of these pumps were made by the U.S. company, Dempster, Inc. It was found that 25 percent of all pumps failed after one to one-and-a-half years of operation. This percentage rose dramatically with time; over 80 percent of all pumps were broken after four to five years. The most common pump failure was the breakage of the pump connecting rod. An equally important reason for the non-operation of the pump was the well drying up due to poor location, caving in, or insufficient depth.

In villages with fewer than 1,000 people, 35 percent of the handpumps were working, while in villages with over 1,000 people, 53 percent of the handpumps were working. This suggested that although handpumps might receive more use in larger towns, there was usually some provision made for maintenance which gave the pump a longer life expectancy. The only established maintenance program operating in the country for handpumps was run out of the Bo office of the Ministry of Social Welfare and by the Eastern Mobai Clinic. Both programs suffered from a lack of spare parts, tools, and transport.

Water Systems--Pumped and Gravity-Fed. Of the 40 water systems surveyed, 10 were pumped systems and 30 were gravity-fed systems. Of the pumped systems four were working; of the gravity-fed systems 26 were working.

Nearly half of the gravity-fed and 60 percent of the pumped systems surveyed were located in the Northern Province. There were also a substantial number of gravity-fed systems in the Eastern Province and Western Area while there was only one found in the Southern Province. The few remaining pumped water systems were fairly evenly distributed throughout the country.

Gravity-fed water systems which were working ranged from one-and-a-half years to 60 years of operation. Pumped water systems failed as quickly as three months and as late as four years after installation. Failure of gravity-fed systems was due to broken pipes and valves while the majority of pump system failures were due to mechanical failure of the pump itself.

From the survey sample, it was estimated that gravity-fed water systems could be expected to last more than 20 years while pumped water systems would last approximately five years.

There was no clear relationship between failures of gravity-fed systems and village size. However, with pumped water systems it was found that in villages with fewer than 2,000 people, only 14 percent were working.

Twenty-eight gravity-fed systems and seven pumped systems were maintained by the local community, while the remaining two gravity-fed and three pumped systems were maintained by the Ministry of Energy and Power.

A total of 65,000 people were originally served by gravity-fed water systems. At the time of the survey, 60,000 people were being served. Also, a total of 21,000 people were once served by pumped water systems, but only 8,500 people continued to be served due to breakdowns.

Summary of Important Findings. Of the total rural population in Sierra Leone, estimated at over two million people, only five percent had access to handpumps or a piped water system. In rural areas of Sierra Leone, 30,000 people were served by handpumps; 45,000 more had had use of handpumps at one time but were denied use due to breakdowns or improper initial installation. With little or no maintenance, the Dempster Pump had an estimated lifetime of between two and two-and-a-half years of intensive use.

Gravity-fed water systems served 60,000 people; pumped water systems served 8,500 people. Gravity-fed systems lasted longer and were cheaper to maintain than pumped water systems. The total rural population being served by handpumps, gravity-fed, and pumped-water systems was estimated at 100,000. An additional 60,000 people could be served by repairing existing water facilities that had failed. The majority of these failures involved handpumps which, it was assumed, would be the easiest and cheapest to repair.

It is not known exactly what percentage of the total number of installations in the country were surveyed. One estimate is that 50 percent of the handpumps installed in rural up-country areas, 90 percent of the gravity-fed water systems, and 80 percent of the pumped water systems (excluding Degrement systems) were covered in the survey. This is a rough estimate and perhaps an optimistic one.

Recommendations

1. A maintenance unit for rural water facilities should be established under the Ministry of Energy and Power. This unit should include skilled personnel, reliable transport, spare parts, storage, and tools for repair.
2. A field test on newly-developed handpumps should be conducted in an attempt to move toward standardization of designs and parts. This should be completed before any large-scale order of new pumps is undertaken.

3. Due to the high initial costs and short life expectancy of pumped systems, and the fact that many of the suitable locations for gravity-fed systems have already been taken, it is recommended that the Provincial Village Water Supply Program concentrate more resources and efforts on handpumps and other inexpensive water supply technology.

The form used for this survey follows.

APPENDIX E.2

VILLAGE WATER SUPPLY SURVEY FORM

1. SURVEYOR __________ DATE __________

NAME __________ DESIGNATION __________

2. VILLAGE

NAME __________ POPULATION __________

CHIEFDOM __________ DISTRICT __________ PROVINCE __________

SCHOOLS __________ SECONDARY __________

HOSPITAL __________ HEALTH CENTER __________ DISPENSARY __________

MARKETS __________ LOCAL __________

3. TYPE OF SUPPLY

(a) PIPED SYSTEM:

GRAVITY __________ PUMPED __________ HYDRAULIC __________

RAM __________ OTHERS __________

STANDPIPES __________ STORAGE TANK __________ TYPE OF PIPES __________

TYPE OF TAP __________

(b) WELL:

HAND PUMP __________ BUCKET/PULLEY __________

BUCKET/ROPE __________ DEPTH __________ DIAMETER __________

WATER DEPTH __________ HANDPUMP TYPE __________

4. HISTORY OF SUPPLY

PAST:

(a) Construction date __________

(b) Constructed by __________

PRESENT:

(a) Latest improvement __________

(b) By whom __________

(c) Village contribution ______ (c) Who maintains it ______________

______________________ (d) Who operates it ______________

(financial or otherwise) (e) Who supplies fuel ______________

5. PRESENT STATUS OF WATER SYSTEM HAND PUMP OR WELL

a. Is it presently working? _____ Yes _____ No _____ Partially

If partially, explain. ______________________________

____

____

b. How clear or polluted does the water appear?

____

____

c. If it is not working, how long has it been out of order?

____

____

d. What went wrong with it? ______________________

____

____

e. What is needed in order to fix it? ________________

____

____

6. OTHER INFORMATION:

APPENDIX E.3

Interministerial Committee's

Guidelines for Environmental Health Education Component of the National Rural Water Supply Projects

All Environmental Health Education (E.H.E.) activities and programs must be approved by the National Water Committee (NWC) or its representative. Environmental Health Education program activities must be planned by the NWC respresentative, Wells Coordinator, and District Environmental Health Coordinator.

The Environment Health Education component is a major embodiment of the National Rural Water Supply campaign. The Wells Coordinator, who is directly responsible for the District Rural Water Supply Campaign, will have overall authority and responsibility of all Environmental Health activities in the District.

It is recommended that each district select (on the recommendations of the NWC Representative and Wells Coordinator) a coordinator of Environmental Health Education plus two assistants.

Monthly allowances of LE60.00 to district E.H.E. Coordinator and LE45.00 to each of the two Assistants will be paid by the NWC representative or Wells Coordinator at the end of each month.

A flat fee of LE15.00 per month will be advanced to each worker (District E.H.E. Coordinator and Assistants) to cover overnight, per diem, or bush allowance as the case may be.

The ceiling for all workshop expenses is LE100,00 per village or Le500.00 per workshop. This will include expenses for 25 participants, guest speakers, refreshments, etc. It is therefore recommended that each workshop be planned for three days, use three to six guest speakers, prepare lunch per day for the entire group, and be very selective for the type of refreshment.

District E.H.E. Coordinators must submit activity plans to the Wells Coordinator at least one week in advance. This will assist the Wells Coordinator in planning for transportation needs of the Environmental Health Component.

At least one motorcycle has been budgeted for each district. These will be purchased and delivered as soon as local purchase is approved by UNICEF; otherwise, the allocated funds will be allocated for other Environmental Health Education needs.

Job Descriptions

a. District Environmental Health Coordinator

- Directly responsible to the Wells Coordinator.
- Serves as a District Representative of the National Water Committee.
- Makes weekly or bi-weekly activity plan for Environmental Health Education to the Wells Coordinator.
- Holds at least 20 Environmental Health follow-up sessions at participating villages.
- Supervises the activities of the E.H.E. Assistants.
- Attends planned meeting of the National Water Committee when invited.
- Helps solicit and coordinate villagers' contributions in-kind for the Wells Project.
- Plans and organizes Envionrmental Health Education workshops in consultation with the Wells Coordinator as represented.

b. District Assistants

- Responsible to the District E.H.E. Coordinator.
- Presents a bi-weekly work schedule to the District Coordinator.
- Holds at least 40 Environmental Health follow-up sessions at participating villages.
- Helps to organize villagers for their contribution to the overall wells project.

Environmental Health Education Content (must include but not limited to)

- Village organization and involvement in community development.
- Community responsibility in matters of environmental sanitation.
- Sources of environmental contamination of water supplies.
- Methods of providing clean drinking water to rural community.
- Construction of a protected drinking water well.
- Villagers' responsibility for use and maintenance of water supply.
- Use and maintenance of latrines and prevention of diseases.
- Water and food related diseases and their control.

Environmental Health Education workshop and follow-up sessions must be held at participating villages before any Wells Construction activity should take place.

APPENDIX E.4

Village Based Training

A pre-service training model developed in Sierra Leone

Excerpted almost verbatim from a paper by Craig Hafner
(Water/Sanitation Sector Specialist, OPTC, April 1979)
with information provided by Hafner and David Yohalem,
former Agriculture and Rural Development APCDs/SL,
and Allieu Musa, Training Officer, PC/Sierra Leone (1979)

A Village Based Training Model from Sierra Leone

Introduction

In the past four years (1975-79), the Peace Corps program in Sierra Leone has developed an incountry ten-week pre-service training model using rural villages as temporary training sites. In the fall of 1978, PC/Liberia adopted the approach for most of their training, PC/Gambia has run a similar program, and other countries in all three Peace Corps regions have experimented with all or some of the components.

The basic idea is not new. It has been tried in numerous countries in many different programs with varying degrees of success through the years. As with many incountry training models, its success is dependent on a reasonably stable host country government, generally favorable PC/host country relations, the participation of a number of experienced former and present PCVs and the close involvement of the appropriate Peace Corps programming officer.

The Model

The essential characteristics of the training model include:

- a small rural village as the main training site (a different village is used every year);
- a thorough integration into the village life by the trainees and staff who live with families in the village--this facilitates cross-cultural and language learning activities and experience;
- a heavy emphasis on practical learning by doing technical and extension exercises under precisely the same conditions as the Volunteers will encounter in their assignments;
- a low staff to trainee ratio--using large numbers of host country instructors, present and past Volunteers and some outside consultants and experts;
- extensive preparations which require the villagers and some Volunteers to repair existing structures and build some basic new facilities (latrines, a well, or spring box) in the village prior to the beginning of training;
- the inclusion of host country counterparts as trainees for most of the technical training (the Ministry of Agriculture has reimbursed Peace Corps for the basic expenses) and as trainers for cross-cultural activities. This has facilitated the integration of the program into the Ministry of Agriculture.

Rationale

With the slow evolution of the model over the past five years has come a clearer idea of why it is worthwhile. It has been found to provide:

1. an appropriate location for effective pre-service training;
2. tangible benefits and improvements of living conditions of rural poor people;
3. recognition of rural people's contribution to the training as well as developoent processes; and
4. a training approach for Sierra Leone's Ministry of Agriculture to follow.

Effective training can often be optimized by closely integrating language, cross-cultural, and technical components together. The live-in situation, and the close personal contacts which derive from it, have long been considered the best practical experience for cross-cultural learning. Language is also learned more effectively and quickly when it is taught within the environment where that language is spoken. Extension training, which is a major thrust of this program in Sierra Leone, is also made more relevent when local farmers are asked to participate and the trainee has to deal with their questions and concerns.

From 1975 to 1979, it is estimated that Peace Corps has spent over $70,000 of training funds in order to prepare village training sites for the trainees and staff. This money would normally be paid to a training institution for the maintenance of facilities and administrative costs. The physical improvements have included upgrading housing, latrines, water supply conditions and the development of some swamps for rice production.

A more subtle result of the presence of the training program in a village is its effect on the villagers. By actively seeking out their cooperation, advice, and assistance in the planning and implementing of the program, we are recognizing that they are an important source of information and knowledge. By showing respect for the local customs and language, the trainees and staff have contributed to the enhancement of the villagers' self-respect and pride.

A different village has been used every year because it is believed that using the same village over and over would lead villagers to have unrealistic expectations, it might foster a dependency on outside assistance, and not assist in the development of self-reliance in the villagers.

Drawbacks and Attempts at Solutions

The idea of a nonpermanent village training site has not been carried out without some problems and criticisms. As with many incountry training programs, it has tended to add significantly to the workload of the regular Peace Corps administrative and logistical staff. It has been argued that it has taken Volunteers away from their primary assignments for too long a time and this is not "Peace Corps service." It has also been speculated that by using the village there will be a negative impact on the villagers after the program is over.

These concerns and criticisms have been discussed and debated over the last few years by the PC/Sierra Leone staff and Volunteers. This has led to some modification but for the most part it has led to better and more effective planning. With improved planning and preparation, the increased workload on the regular Peace Corps staff can be reduced, but not entirely eliminated.

In the early programs training sites were piced one to two months prior to the start of training. By picking the location at least six to eight months early, the village preparations and organization can be spread over a longer period of time and not take the participating Volunteer (designated as the site administrator) or Peace Corps staff away from his or her othe work all of the time for one or two months as has been the case. By having a number of Volunteer trainers, their training participation can be scheduled intermittently so that it can reduce the time away from their home village. This does, however, assume that the program has a relatively large number of existing PCVs to call upon, which would not be the case in a newly developed program.

The criticism that there will be a negative effect on the village and villagers has to be weighed against the positive effects. Recent Washington staff observers have tended to conclude that the positve effects of improved living and sanitation conditions, increased employment and money, albeit temporary, in the village, the training of village farmers in improved farmers technique, and the establishment of some very strong friendships and relationships between trainees, staff, and the villagers, outweigh the potential detrimental effects.

The question of whether it is appropriate for Volunteers to be away from their village training other PCVs for as long as five months during their 24-month service also needs to be addressed. In Sierra Leone it is argued that the training of counterparts is the ultimate goal of the program and that by including Sierra Leonean agricultural extension agents as trainees in the pre-service technical training of new Volunteers, this justifies the lengthy period away from their villages of some Volunteer trainers. It is also felt that the opportunity to work on a pre-service training program offers valuable in-service training for first and second year Volunteers. Another benefit which has come out of the pre-service training has been the development of detailed agricultural extension manuals and materials which have recently been adopted by the Ministry of Agriculture for use in their two extension training schools. Finally, it is argued that having a Volunteer be away from his or her village for a period of time provides the opportunity for villagers to try a new idea without the Volunteer's assistance and break the dependency that sometimes develops.

PROJECT PLANNING

The information on project planning in Appendix F is excerpted from the Peace Corps Programming System Handbook, June 1981. A sample project plan form is included here as well as an example of the project development process as written by the Water/Sanitation Sector Specialist in 1979 for a rural water project in Kenya. Complete guidelines for project planning are contained in the manual which is available through the Peace Corps Information Collection and Exchange, 806 Connecticut Avenue, NW, Washington, DC, 20526.

PROJECT PLANNING

Project Design: Preliminary Phase

The development of new projects may begin in a number of ways:

- a need, priority, or idea proposed by the host country or drawn from its development plans;
- a need identified at the local level by the Peace Corps staff or Volunteers and recognized by host country officials;
- innovative Volunteer activity in an existing project;
- other needs which become apparent as an existing project progresses;
- the plans of another development agency cooperating with the host country which contain valid roles for Peace Corps.

The first steps in project design are to develop a project team, and together to carefully analyze and define the problem at hand. The project team, including the programmer, host country people, and collaborating agencies, should trace and identify the principal causes by consulting various information sources at the local, regional, national, and perhaps international levels. Analysis of a problem requires an identification of its effects on people, especially those of concern to Peace Corps--the most needy, women, the landless, etc. Remedial efforts of local and/or foreign agencies should be enumerated and described. Once Peace Corps and the host country perceive the problem in a mutually acceptable way, a logical building process to solve it can follow. When assessing the feasibility and appropriateness of alternative solutions, both positive and negative impacts should be considered. The most acceptable alternative is selected, developed, and fully scoped out as a project. This process involves defining the project's goals and objectives in terms of desired effects on people and an increased capacity to improve conditions. Goals and objectives then determine project outputs and resource needs, including Volunteer assignments (tasks, skills, and training).

Ongoing Use of Project Plans

The project plan becomes the basic working document and is shared with all project participants. It is part of the country's working files and is used in Washington for information and overall program monitoring purposes, as well as for information sharing. It is used as a basis for mobilizing resources, checking progress, identifying problems or needed adjustments, and for conducting evaluations. Technical consultation on final project plans or any possible revisions may be requested from Washington at any time.

Final Project Design and Documentation

Purposes/Outcomes. Final project design involves the project planning team incorporating whatever feedback it has obtained on the initial project design from the project consultation process in PC/W and from further information gathering in-country. It represents the best current snapshot of the project's scope and details. This is subject, of course, to further changes which may occur as it is implemented.

The final planning focuses on two levels--overall project design and the Volunteer assignments. In terms of overall design, the following are finalized and documented:

- the organizational structure and relationships in the project, with emphasis on those involved in the startup period;
- the problem statement, causes and consequences, and the sources of information used in the analysis;
- the project goal, including both production and capacity-building, and the indicators and sources of this information;
- the objectives for the first 12 to 18 months, and related performance indicators;
- the resources, sources, and the nature of the commitments to provide them; and
- plans for project management (monitoring and evaluation).

In terms of Volunteer assignments, the following are finalized and documented:

- tasks in the initial Volunteer assignments;
- entry skills required;
- skills to be acquired during service;
- training objectives and strategy (pre-service in detail, in-service in broad terms);
- complete information on as many potential PCV sites as possible;
- plans for final site preparation before the first trainees arrive;
- final resource and Volunteer support arrangements;
- contingency plans if resources are delayed;
- programming for spouse's assignments (if any);
- information package(s) for invitees; and
- training materials.

Documentation: Project Plan and Final Trainee Assignment Criteria (TAC)

The Project Plan form (see page 287) and the Trainee Assignment Criteria (TAC) form are required to record the final project planning and should be part of permanent field and PC/W files. Task analyses and site surveys should be part of the permanent field reference materials, and should be retained in the country's project files as long as they are relevant and useful.

Other important documentation is the record of training objectives, specifications of strategies, and related training materials, though Peace Corps presently has no standard format for recording these items.

The principal difference between preliminary and final project design is the required level of definition, the amount of supporting detail and the degree of mutual commitment. The basic concepts are the same between Peace Corps and host agencies.

Sample Project Plan Form

PROJECT PLAN

PEACE CORPS/__________________

Project Title ____

Project Code ____________________ **Human Need Area** _________________

Start Date________________________ **End Date**__________________________

Date Original Plan Prepared__________ **Date Approved**_________________

Date of This Plan____________________ **Date Approved**_________________

SECTION 1 - PROJECT RELATIONSHIPS

A. Host Agency(ies)

B. Sponsoring Unit(s)

C. Primary Function of Sponsoring Unit(s)

D. Address(es) of Sponsoring Unit(s)

E. Title of Official(s) in Sponsoring Unit(s) responsible for project supervision

F. Collaborating Agency(ies)

G. Description (or chart) of the lines of authority or relationships in this project

SECTION 2 - PROBLEM ANALYSIS

A. State the problem which the project treats.

B. State the major causes or factors contributing to the problem.

C. Describe the consequences of this problem for people.

D. Describe the information sources consulted when defining this problem.

Describe existing efforts to treat the problem.

SECTION 3

GOALS, OBJECTIVES AND MANAGEMENT INDICATORS

A. GOALS	Measures of Achievement	Sources of Information	Progress/Problems/Actions Taken
Production Goal			
Capacity Goal			

SECTION 3

OBJECTIVES / MONITORING

Project Code________________

Period Covered______________

Date Set___________________

B. OBJECTIVES	Measures of Achievement	Sources of Information	Progress/Problems/Actions Taken

SECTION 4 - VOLUNTEER ASSIGNMENTS

Insert here:

A. Preliminary Tacs for all assignments projected for the life of the project, and

B. Final TACs for the first (or next) training class to enter the project.

SECTION 5 - PROJECT RESOURCES

A. Peace Corps Volunteers

1. Assignment Title	2. On Board as of ____		3. Trainee Requests a. Current FY____	B. Projected			
	Ts	Vs		FY____	FY____	FY____	FY____

339

SECTION 5

B. Other Resources

340

1. Resources Needed	2. Responsible Party	3. Date Needed/Committed

4. Potential Problems or Contingency Plans

341

342

1x

SECTION 6 - PROJECT MANAGEMENT

A. Monitoring Arrangements

1. Procedures	2. Events/Timing	3. Participants

B. Evaluation Plans

SECTION 7 - PROJECT APPROVAL

A. Review Comments

B. Approval/Concurrence

Approved: Date:

Director's Signature(s)

Concurrences:

Signature	Title	Date

MODEL PROJECT PLAN

(Excerpted from report submitted to
the Kenya Peace Corps Director
by the Water/Sanitation Sector Specialist
in November 1979
for a rural water development project
for skill-trained Volunteers.)

PROJECT PLAN

PEACE CORPS/KENYA

PROJECT TITLE: Water Development

PROJECT NUMBER: 615-

START DATE: May 15, 1980

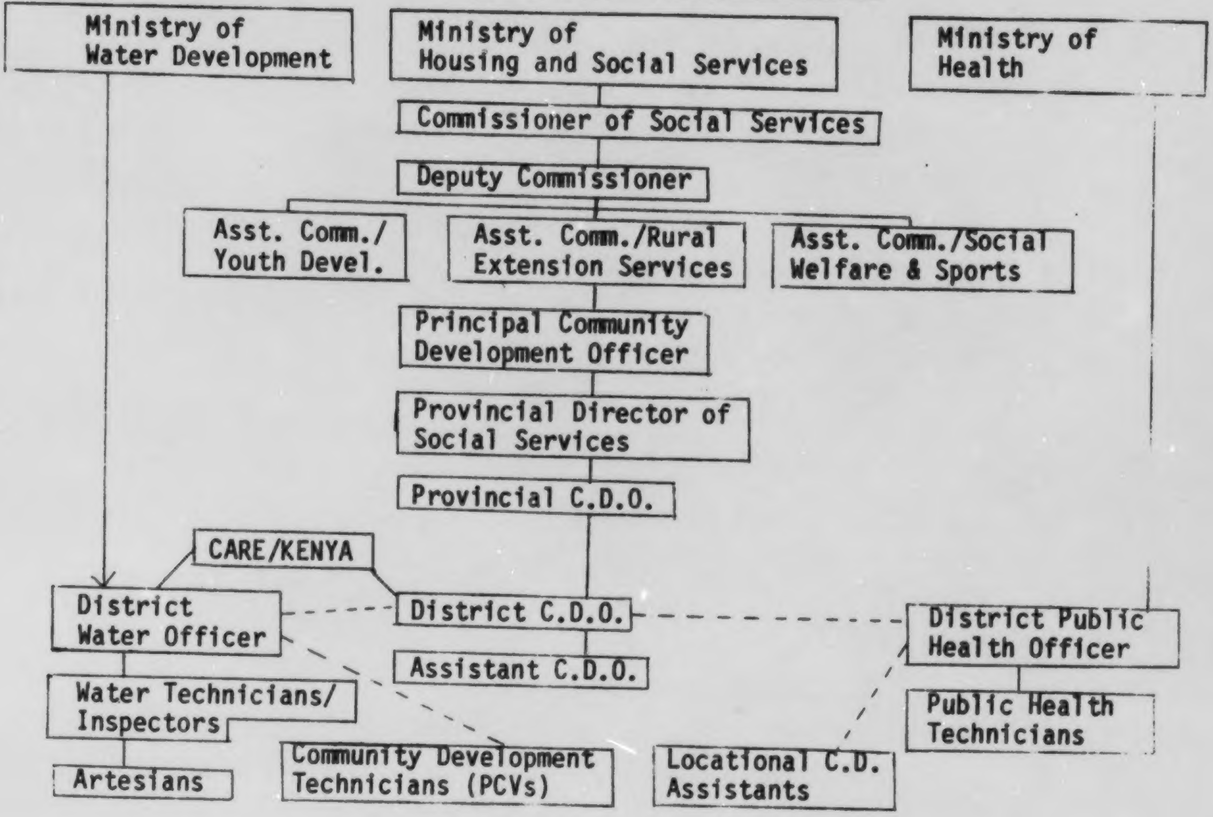
END DATE: 1986

DATE OF THIS PLAN: November 9, 1979

Section I: Host Agency Information

1. Host Agency: Ministry of Housing and Social Services
2. Sponsoring Unit: Department of Community Development
3. Address: MHSS, Gill House, Nairobi
4. Primary Function: One of the Ministry's many functions is the support and assistance in facilitating Harambee (self-help) projects and in channeling resources to meet basic needs such as water, health, and educational facilities.
5. Project Supervisor: Principal Community Development Officer, Nairobi
6. Institutional Relationships Chart: See next page

Institutional Relationship Chart


Ministry of Water Development
Ministry of Housing and Social Services
Ministry of Health
Commissioner of Social Services
Deputy Commissioner
Asst. Comm./ Youth Devel.
Asst. Comm./Rural Extension Services
Asst. Comm./Social Welfare & Sports
Principal Community Development Officer
Provincial Director of Social Services
Provincial C.D.O.
CARE/KENYA
District Water Officer
District C.D.O.
District Public Health Officer
Assistant C.D.O.
Water Technicians/ Inspectors
Public Health Technicians
Artesians
Community Development Technicians (PCVs)
Locational C.D. Assistants

Section II: Problem Analysis

1. State the Problem

Approximately 500 villages in Kenya lack the technical and organizational skills to implement, operate, and maintain self-help water and building projects. The institutional capacity of the central government to take over these projects and assist them in other than initial survey and design work is severely limited and is likely to remain so for some time.

2. Sources

- Ministry of Housing and Social Services (MHSS)--personal conversations with the Commissioner of Social Services with 14 District Community Development Officers and their staffs.
- Ministry of Water Development--Planning Office, District Water Officers, Water Inspectors.
- Office of the President--District Commissioners, Provincial Planning Officers, District Development Officers.
- Village Self-help Committee--personal conversations with over 30 Self-help Committees.
- WHO
- CARE
- USAID--Report by Gene McJunkin, March 1979.
- UNICEF

3. Major Causes

a) Insufficient planning and estimation of costs of projects.

b) Lack of skilled technician to assist villages in the implementation.

c) Inadequate training of local builders and equipment operators.

d) A greater emphasis placed on capital development by external donors and GOK rather than on manpower training and improving the government and the local communities' capacity to meet recurrent costs.

4. Major Consequences

- Women and some chidren spend as long as three hours a day walking as far as 10 kilometers to draw water from oftentime polluted water sources.
- Since it is difficult to obtain water, an inadequate amount of water is used for personal hygiene and household cleansing resulting in significant incidences of water-washed illnesses.

- The arduous work of drawing water by pregnant women can have an effect on the size and general health of new-born infants.
- Inadequate and poorly constructed facilities and water systems have collapsed or quickly deteriorated.
- Poorly-planned projects have run out of money and materials and/or in some cases they have been insufficient to meet the needs of the anticipated population.

5) Sponsoring Organizations' Efforts to Address the Problem

The Ministry of Housing and Social Services has a limited number of building inspectors and local artisans but much of their work is taken up by central government building projects rather than self-help projects. The Locational Community Development Assistants (LCDAs) are not given technical training. CARE/KENYA has been working closely with the MHSS as well as the Ministry of Water Development (MWD) in providing funds, some technical assistance, and most recently training for self-help committee members in management and bookkeeping. The Ministry of Health and MWD have in the past run a UNICEF-sponsored pump operators training course, but these were stopped in 1977. CARE plans to start these up again and the MHSS also plans to run some seminars on management of self-help projects for committee members. The MWD technicians have little time available to train local villagers and much of their work is taken up by large government (non-self-help) projects.

The Village Technology Unit has not been able to do much extension or outreach work in villages with their appropriate technology ideas.

6) a) How does the problem promote or limit women?

By not having available or easily accessible water in villages, the women (who are virtually all the water drawers) spend considerable hours each day fetching water. These hours could be used more productively in individual agricultural projects or in community and women's group projects.

b) Women's participation in the solution

- Female PCVs will serve as an example for villagers demonstrating that women can work as technical resource advisors and trainers.
- Female LCDAs will be trained by PCVS.
- Local women will be instructed in water/health classes.
- The project will seek out and train female pump operators.
- Female self-help committee members will also be trained in management and bookkeeping.

Section III: Peace Corps Project Goals and Objectives

A. Goal

To institute a system whereby by 1986, the number of completed and adequately maintained self-help water and building projects will have increased by 150.

B. Objectives

1) By June 1980 place 10 PCVs, Community Development Technicians, in 10 separate locations each assisting 3 self-help water or building committees.

2) By September 1980 water and village assessment surveys will have been conducted in 30 villages.

3) By December 1980 guttering, water jar, and water filter demonstration projects would have been built for schools, clinics, or houses in 10 villages.

4) By February 1981 training programs in management and bookkeeping of self-help committee members would have been designed, organized, and implemented in 4 villages.

5) By February 1981 repair and maintenance training programs for engine and pump operators would have been designed, organized, and implemented in 3 villages.

6) By May 1981 200 informal and formal classes would have been conducted with villagers dealing with the need for clean water, how water is polluted, personal hygiene, and sanitation.

7) By June 1981 basic engine and pump repairs and maintenance would have reactivated 5 water systems.

8) By June 1981, 3 new water systems would have become operational following the completion of pipe laying, pipe connecting, spring box construction, water storage tank construction, or public stand pipes.

9) By June 1981 10 additional Community Development Technicians would have been assigned to 10 additional locations each assisting 3 self-help water or building projects.

10) Repeat similar objectives with some second year PCVs being transferred to new locations.

Section IV: Volunteer Assignment

1. **Volunteer Assignment Title**: Community Development Technician

2. **Responsibilities**:

- Work closely with, train, and help to motivate coworker, Locational Community Development Assistant (LCDA).

- Meet regularly, report verbally and in writing at least once a month to the District Community Development Officer (DCDO).

- Liase with Ministry of Water Development, Ministry of Health, Ministry of Agriculture, Ministry of Works, and CARE/KENYA field and district level officers on all matters related to self-help projects.

- Serve as a technical and resource advisor to village self-help committee.

3. **Tasks**:

- Advise and assist newly formed and/or on-going self-help water and building committees in planning, budgeting, and implementing water and building projects.

- Develop relationships, cultivate trust and confidence in the local community and especially the project committees. Assist them in clarifying their needs.

- Train water and building committee members in estimating capital and recurrent costs of projects as well as assisting in the establishment of payment and bookkeeping procedures.

- Train equipment operators, men and women, on proper preventive maintenance and minor repairs on Lister engines and Blake and Southern Cross pumps. Set up maintenance schedules with water committee Chairman. Provide the follow-up to the interministerial operators course.

- With the approval and concurrence of the Ministry of Water Development and Ministry of works, supervise and train villagers in:
  -- surveying for pipe lines--main line and distribution
  -- the laying and fitting of galvanized and PVC pipes;
  -- repair and replacement of broken pipes;
  -- the construction of water storage tanks (1,000, 10,000, 20,000 gallons), pump houses, spring boxes, public stand pumps, public buildings, schools.

- Introduce, where feasible, alternative approaches to water storage and catchment, such as:
  -- guttering of roofs of houses, schools, clinics, all public buildings;
  -- inexpensive water jars and tanks for catchment;

  - underground water storage tanks;
  - water filters;
  - infiltration galleries and shallow wells near dry riverbeds;
  - other innovative ideas being developed at the Village Technology Center in Karen, sponsored by UNICEF.

- Assist public health technicians and local teachers in developing programs, courses, bazaars, materials for use in the village on:
  - the relationship between water and health;
  - improved sanitation methods related to water;
  - appropriate approaches to improving water quality in the village;
  - ways in which clean water can become polluted after being taken from the source;
  - ways in which a clean water source can become polluted.

- Assist water and buiding committees, when appropriate, in writing funding proposals for materials and equipment which the villagers are unable to raise to be submitted to the District Development Committee, CARE/KENYA or other possible donors: National Christian Council of Kenya, National Council of Women of Kenya, European Economic Commission.

4. Transfer Skills Opportunities

(See tasks above.)

5. Cross-Cultural Expectations

- Understand and be sensitive to the villagers daily schedule, farming season, traditional beliefs, and customs which might conflict with project's schedules and your expectations.

- Accept Kenya standards of behavior, appearance, and cleanliness when in a village, District or Province Headquarters, or Nairobi.

- (See cross-cultural tasks.)

6. Secondary Activities

- Establish a vegetable garden of your own or with a local school.

- Assist and advise villagers in additional self-help projects besides water and buildings.

- Conduct adult education tutoring.

- Organize sports teams and activities.

- Advise and assist teachers in Village Polytechnic Schools.

Section V: Project Resources

1. **Essential Resources**

- Housing for PCVs
- Transport--motorcycle
- Petrol
- Furnishings for PCVs
- Counterparts
- Supervision
- Self-help labor
- Tool kit
- Health education materials, A.T. materials
- Funds for self-help projects
- Transport of materials

2. **Resource Donors: MHSS, Village, MWD**

a) Host Country

- Ministry of Housing and Social Services:
    - -- supervision
    - -- counterparts' salaries
    - -- furnishings for PCVs
- Village:
    - -- housing
    - -- self-help labor
- Ministry of Water Development:
    - -- design approval, technical advice
    - -- transport of materials
- Ministry of Health:
    - -- public health information

b) Third Parties

- CARE:
    - -- funds for self-help projects
    - -- health education materials
    - -- training course materials for operators and managers
- EEC:
    - -- funds for projects
- USAID:
    - -- 20,000 from IRT for gutters and storage jars
- UNICEF:
    - -- appropriate technology materials and information

c) Peace Corps

- No PCVs in project as of November 1979
- Estimated number of Volunteers:
  FY80--10
  FY81--20
  FY82--25
  FY83--25
- Other Peace Corps Resources
  - -- motorcycle, repair kits
  - -- tool kit
  - -- health and community development educational materials
  - -- appropriate technology information and ideas

3. Potential Problem

- transport of materials by MWD
- conflicts with MWD over technical supervision, designs, priorities, appropriate technology
- local politics interfering or hindering self-help support
- resistance of villages to having to pay for water
- delays in funding and materials delivery.

Section VI: Monitoring and Evaluation

1. The project will be monitored by:

- monthly meetings of PCVs and the supervisors, the DCDO in the District Office--to review past, present, and future work;
- monthly or bi-monthly field visits of the DCDO to the PCVs' projects;
- quarterly or semi-annual meetings of all PCVs with the DCDO and the APCD/Rural Development in Provincial Offices or Nairobi to discuss common problems, constraints, areas of collaboration, networking. This meeting could also provide an opportunity for in-service training of PCVs and their counterparts (LCDAs); also meetings with technical advisors and external donors such as CARE, UNICEF, etc.;
- at the end of 3 months, each PCV placement will be assed by the APCD, DCDO and MHSS-Principal CDO to determine whether commitments have been met by all parties.

2. The project will be evaluated by:

- the degree to which villagers have assumed control, payment, and management for the operation and maintenance of the water and building projects;
- the number of functioning water and building projects and extensions that have been completed;
- the number of classes, seminars, workshops, training programs which have been conducted for village workers, artisans, pupils, women, committee members, pump operators, and teachers;
- the degree of satisfaction expressed by the village self-help committees, the coworkers (LCDAs), supervisors (DCDOs), and Principal CDO funding agencies and the APCD/RD with the PCVs' performance;
- the degree of satisfaction expressed by the PCVs themselves;
- whether the Ministry of Water Development will decide to use the approaches, methods, techniques of obtaining community participation in order to assure the long-term operation and maintenance of the water systems.

JOINT PEACE CORPS WATER TRAINING

TERMINAL TECHNICAL TRAINING OBJECTIVES

At the end of the Pre-Service Training (PST) each trainee will have individually or in small groups:

- Located, surveyed, designed, constructed:
    - a simple spring box with a G.I. pipe connection;
    - a 5,000 or 10,000 gallon concrete water storage tank, complying to the MWD "Design Manual" specifications;
    - a basic latrine--commonly used in Kenya, as well as possibly another innovative design (VIP);
    - low-cost guttering system for at least one building;
    - a variety of water storage jars--to be used as storage for rain water from gutter;
    - possibly a basic pump house (using MWD design);
    - the surface structure for a hand-dug well.
- Repaired and overhauled a hydram and water storage tank.
- Repaired and fit the G.I. pipes 2", 2 1/2", 3" using slip joint and cement.
- Surveyed (using a basic hand level) and laid out and connected at least 40' of PVC and G.I. pipe.
- Cleaned and renovated a hand-dug well.
- Constructed a simple water filter and a simple slow-sand filter.
- Performed basic maintenance or, overhauled and maid simple repairs on, a 6 or 12 HP Lister engine.
- Spent 5 hours riding on a 90cc or 125cc motorcycle and completed a basic riding, maintenance, and repair course for motorcycles.

The Peace Corps Trainee (PCT) will be able to:

- Prepare a basic proposal and project design documentation to receive self-help funding assistance from: DDC, CARE/Kenya, EEc, USAID.
- Read and interpret engineering drawing, draftsmen's work and designs.

- Measure water flow and recharge rates and translate that into daily, monthly, yearly water availability.

- Describe and demonstrate an ability to supervise the various mixtures of cement, sand, and aggregate required for building foundations, walls, water storage tanks, and latrine slabs.

- Work with steel rebar and describe the requirements necessary for the above mentioned projects.

- Effectively teach classes to rural villagers in Swahili on:

  - the relationship of water and health;

  - the ways clean water can become polluted prior to use and how to prevent it;

  - the ways water sources can become polluted and how to prevent it;

  - how to improve personal hygiene and environmental sanitation.

- Estimate the total cost of a project from a basic engineering design and drawing.

- Describe how these self-help projects will effect women and how to develop a strategy for increasing their involvement and participation at all stages of the planning and implementation.

- Determine the appropriate pipe sizes and necessary fittings for gravity-fed and engine-driven water systems.

The PCT will also have completed training in community development and be able to:

- Assess and interpret community needs to the authorities.

- Acquaint himself with development plan priorities.

- Together with the community, formulate plans and carry out effective projects.

- Initiate team-work with workers of other extension services to encourage coordination of programs for the benefit of the community.

- Stimulate action, encouraging people in the belief in their capabilities but also being a teacher in the problem solving process.

- Act as the link between the community and resources: technical material, financial, and training needs of the people.

- Initiate and guide the development of new institutions and services necessary for the community.

- Report and analyze programs statistically and narratively.
- Teach and supervise junior staff, encouraging staff development.
- Make effective administrative arrangements of her work, always maintaining a balance between her professional and administrative responsibilities.
- Understand and respect the role of the family and the effects of change on family structure, including the social and economic roles of women and their participation in community affairs.

Criteria for Site Selection of Peace Corps Volunteer CD Technicians

1. Enough work: at least three water and/or building self-help projects within a 15-20 mile radius of their home village.
2. Village is able and willing to provide housing free of charge. The house will have as a minimum a concrete floor, a latrine, a roof that doesn't leak, and at least one lockable room.
3. The water and building projects have been surveyed and the designs have been approved by the Ministry of Water Development or MOW.
4. Some funds are available from external donors, DDC, or central government.
5. The village has committed some funds for the project.
6. There is a good working relationship between MHSS and MWD at the district and locational level.
7. The water project will not be replaced by a larger MWD water project for at least 3 to 5 years.
8. Village lacks technical advice.
9. All parties (villagers, DCDO, MWO) are aware that if funds and village commitment are not forthcoming in a reasonable period of time that the PCV will be transferred to another area where there is work.

Tentative Placements for the Community Development Technicians
As of November 6, 1979
as agreed by Stanley Wandeto and Craig Hafner

1. Mutumo: 3 water projects, all gravity fed, Katothya/Kitui District/Eastern Region

2. Ngwata: near Kibwezi, Makindu Division/Kachakos/Eastern Region; 3 water projects--Mangelete, Komboyoo, Thange

3. Taita-Wundanyi: 3 projects--Murray Girls School, water and building; Bura Rehabilitation and School, water and building projects; Mazizi, possible?

The following appear to be likely sites but will need further research and visits.

4. Mbooni: Eastern Division/Machakos District, Utangwa, Kiteta-near Tawa

5. Taveta: many self-help water projects, isolated, poor area, known to have outbreaks of cholera, near Tanzania border

6. Bamba: northern part of the Kilifi District, Coastal Province; strongly recommended by DC and DDO, very dry area, at southern edge of Tsavo East Game Park; it will not be affected by the Sabaki River Project as most of the rest of Kilifi District;

7. Kisii, Nyanza: many people, fairly dry area, USAID is considering a water project in the area near Sigor

8. Embu: many self-help water projects, some problems, needs further study

9. Rift Valley Province: PDSS very supportive of the idea, he would like a PCV in each of his districts

10.

Potential Coworker for PCV:

Locational Community Development Assistant (LCDA)

Job Description:

- Responsible for all self-help projects in their area.
- Answerable to the Assistant Community Development Officer, District level.
- Answerable also to the District Officer.
- Needs to liase with Ministry of Water Development, Ministry of Agriculture, Ministry of Works

Qualifications:

- Four years secondary school plus one year course at the Kenya Institute of Administration (KIA). Course includes community development organization, human relations skills, adult education, but no technical training.

Other Information:

- Areas of responsibility can cover a whole division in some cases but generally it is just a location.
- They receive some in-service training at least once a year.
- They don't necessarily come from the village where they live but they must be from a nearby village and of the same ethnic (tribal) group.
- They are recruited by the county or municipal councils.
- They are paid by the county council.
- There is a move to bring them under central government.
- They are both men and women.

WASH TRAINING GUIDES

from

Practical Trainer Manuals in Rural Water Supply and Sanitation: A Description for Potential Users (Draft)

Water and Sanitation for Health Project, May 1983.

Latrine Construction: Training Guide for a 12-day Workshop

Overview

The purpose of these training materials is to provide participants with the needed skills and knowledge for assisting rural communities to organize, implement, and maintain sanitary waste disposal projects. Planning, constructing, and maintaining appropriate and economic latrines is the central theme of this training. Involving the local community during all phases of the project is given equally strong emphasis as construction. Local support and involvement is key to the success of any sanitation effort.

This training is for participants who work in rural community settings with local communities wanting to improve their sanitation facilities. It is designed for participants without the technical skills or knowledge needed to plan and buid economical and sanitary latrines. It is designed to provide sufficient understanding and skills in the planning and construction of latrines to enable participants to motivate and assist others at the local or village level in implementing latrine projects.

This training program is appropriate for project promoters, field workers, rural development specialists, and others involved in the promotion of improved health and sanitation in rural village settings. They may be ministry staff, extension workers, Peace Corps Volunteers, or any others responsible for and interested in improving methods of human waste disposal.

During the workshop, a balance is struck between the technical practical skills needed to build a latrine and the communication and educational skills needed to transfer that knowledge. Participants will be part of a team responsible for constructing a single pit latrine in the local community during the course of this workshop. They will supervise or participate in all the major phases of building a latrine. They will select a site, dig a pit, and construct an appropriate slab and latrine shelter. At the same time participants are learning the technical details of latrine construction, they will also learn effective methods of involving communities in planning and implementing community-wide latrine projects.

Goals of the Workshop

At the end of this workshop, participants will be able to:

- define sanitation and the impact of latrines;
- define the linkage between the lack of sanitary waste disposal and the spread of disease;
- understand and identify critical steps necessary to mobilize a community for any latrine project;
- identify community factors related to the construction, acceptance, and use of a latrine project;
- assess local physical conditions relating to improved sanitation;

- identify human and material resources needed to construct the project and their availability;
- develop strategies to help the community to make an appropriate choice from alternative types of latrines;
- develop a plan for a latrine project;
- be able to construct a latrine appropriate for the village;
- identify strategies for the continued operation, maintenance, repair, and replacement of latrines;
- develop strategies for the use and maintenance of latrines;
- develop a plan to implement a latrine project for "back home" application;
- identify appropriate local and regional linkages for resources and support needed for an effective project; and
- understand the application of learning to other types of sanitation projects.

Rainwater Roof Catchment Systems: A Training Guide for an 11-day Workshop

Overview

The purpose of these training materials is to provide systematic skill development for training local project promoters in the steps and techniques necessary for a project in rainwater harvesting. It provides training in setting up a system intended for either dry or wet areas.

This training manual uses a "project approach" to rainwater harvesting. It is not primarily organized for either strictly technical training or community development training, but a blend of the two. The sessions provide all of the basic steps necessary to develop and carry out a project, from the initial technical feasibility study through instructing the community in how to maintain a completed system. This manual does not present only one option for rainwater harvesting, but introduces the trainees to the best options for local conditions. As such, the training sessions follow a decision making model with a variety of possible options at most of the steps in the project development process.

Goals of the Workshop

At the end of this workshop, participants will be able to:

- use the major steps and basic considerations in planning and developing a rainwater harvesting project;

- assess a community's willingness and ability to support a rooftop catchment system;
- conduct an inventory of local skills, materials, and techniques which can be used in rooftop catchment;
- describe and apply the basic of cement mixing and use of mortar;
- choose the most appropriate technologies for tank and gutter construction;
- design a rainwater harvesting system and all steps and procedures necessary for detailing and ordering construction materials;
- describe and apply basics of tank and gutter construction;
- develop a monitoring and maintenance plan which the community can use and implement; and
- develop action plans for promoting rainwater harvesting in a project area.

Spring Capping: A Training Guide for a 12-day Workshop

Overview

The purpose of this training workshop is to provide participants with the needed skills and knowledge for assisting rural communities to organize, implement, and maintain spring capping projects. Therefore, planning, constructing, and maintaining appropriate spring improvement efforts is the central theme of this training.

During the workshop a balance is struck between the technical skills needed to cap a spring and the community development skills needed to mobilize communities to assume responsibility for their water improvement programs. In the course participants will be involved in the planning and construction of a spring capping system in the local community. They will participate in all phases of this project. At the same time, they will be learning effective methods of involving communities in planning and implementing spring improvement projects.

Goals of the Workshop

At the end of this workshop, trainees will be able to:

- identify resources necessary for a village spring capping project;
- facilitate village leadership activities needed for project implementation;
- identify and apply strategies for involving the community in spring capping activities;

- survey and evaluate sites for potential spring capping;
- communicate and apply relevant theories about water and its relationship to environment;
- develop and implement work plans and logistics necessary for project start-up;
- coordinate and implement work plans and logistics necessary for project start-up;
- design and build a retaining wall for capping springs;
- describe how to design and build two alternative spring capping systems, spring box, and infiltration systems;
- operate, maintain, troubleshoot, and repair capped springs;
- identify strategies for solving most common problems which develop throughout the spring capping process;
- evaluate a spring capping project, document and record information gathered for future use; and
- develop and implement action plans for integrating these improvements into village life for longer term environmental impacts.

Handpump Installation and Maintenance: Training Guide for a 15-day Workshop

Overview

The overall purpose of these training materials is to increase the skills and knowledge of field workers who are interested in playing a role in the implementation of successful village-based handpump programs. The training program is for participants who do not currently have the technical skills and knowledge to implement a handpump program or who desire to practice, review, and refine their present level of understanding and skill.

Our definition of successful is a program that is managed effectively over time by the village itself with a minimum dependence on outside expertise and that results in the use of safe drinking water by the majority of the village population including the practice of proper hygiene and sanitation once the water has left the well.

Participants will have an opportunity to actually plan and implement major aspects of a handpump program during the training course. Through this practical, "hands on" approach, participants will increase their skills and knowledge in two major areas:

- technical skills including site selection and preparation, handpump installation, and maintenance/repairs; and

- community development skills including facilitating village mobilization and decision making, problem solving, user education, and technology transfer.

Goals of the Workshop

At the end of this workshop, trainees will be able to:

- conduct preliminary studies to determine most appropriate villages for handpump projects;
- identify and apply strategies for involving the community in handpump projects;
- survey, evaluate, and select sites for handpumps including an assessment of the quantity and quality of water needed to warrant installation;
- develop an awareness of relevant theories about water and its relationship to health;
- use a handpump project as a strategy for designing and implementing a user education dialogue at the village level;
- design and conduct an appropriate training session on pump maintenance, repair, and monitoring using visual aids, job aids, and other nonformal education methods for use with villagers;
- develop and implement with the appropriate village body work plans and logistics necessary for project start-up;
- coordinate and supervise work force and the procurement and delivery of materials;
- prepare selected sites for receiving handpumps;
- install locally available shallow or deep well pumps;
- operate, maintain, and repair a handpump;
- identify alternative strategies for solving most common non-technical problems which develop before, during, and after handpump installation;
- monitor and evaluate the effectiveness of the handpump program; and
- develop an awareness of national and regional handpump program resources and design a strategy for linking village-based projects to these resources.

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ACRONYMS

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ADB	Asian Development Bank
AI	Agriculture Instructor (Sierra Leone)
AID	Agency for International Development in Washington, DC
AO	Agriculture Officer (Sierra Leone)
APCD	Associate Peace Corps Director
APS	Agents de Promotion Sociale (Togo)
ARD	Accelerated Rural Development, Program of NRWSC (Thailand)
A/V	Audiovisual
CD	Chiefdom Development (Sierra Leone)
CDSS	Country Development Strategy Statement
CFA	Unit of Money (Togo)
CMP	Country Management Plan
CONGAT	PVO coordinating organization in Togo
CORPOSANA	Sanitary Corporation (Paraguay)
COS	Close of Service
CPO	Central Planning Organization (Yemen)
CRS	Catholic Relief Services
CSDP	Community Swamp Development Project (Sierra Leone)
CUSO	Canadian University Service Overseas
CYDA	Confederation of Yemeni Development Associations
DOLA	Department of Local Administration, Ministry of the Interior (Thailand)
DTEC	Department of Technical and Economic Cooperation (Thailand)
ECOWAS	Economic Community of West African States
EEC	European Economic Community
ET	Early Termination

FED	Fonds Europeen de Developpement (EEC Development Fund)
GDP	Gross Domestic Product
GNP	Gross National Product
GOP	Government of Paraguay
GOSL	Government of Sierra Leone
GOT	Government of Togo
GVWC	Guma Valley Water Company (Sierra Leone)
GWD	Ground Water Division, NRWSC (Thailand)
IADP	Integrated Agriculture Development Project (Division of MAF, Sierra Leone)
IBRD	International Bank for Rural Development
IDA	International Development Authority (Sierra Leone)
IDB	Inter-American Development Bank
IMF	International Monetary Fund
IPS	Institute for Social Security (Paraguay)
IST	In-service Training
LDA	Local Development Association (Yemen)
MAF	Ministry of Agriculture and Forestry (Sierra Leone)
MANR	Ministry of Agriculture and Natural Resources (Sierra Leone)
MEP	Ministry of Energy and Power (Sierra Leone)
MOH	Ministry of Health (Sierra Leone; Paraguay)
MOPH	Ministry of Public Health (Thailand)
MOW	Ministry of Works (Sierra Leone)
MPW	Ministry of Public Works (Yemen)
MRU	Mano River Union (Sierra Leone)
MSP	Ministry of Public Health (Paraguay)
MSPBS	Ministry of Public Health and Social Welfare (Paraguay)
MWWA	Metropolitan Water Works Authority (Thailand)

NANEAP	North Africa, Near East, Asia, and the Pacific Sector
NGO	Non-Governmental Organization
NMEP	National Malaria Eradication Program (Thailand)
NRWSC	National Rural Water Supply Committee (Thailand)
OAU	Organization of African Unity
PACT	Private Agencies Collaborating Together
PAHO	Pan American Health Organization
PCD	Peace Corps Director
PC/P	Peace Corps/Paraguay
PC/SL	Peace Corps/Sierra Leone
PCT	Peace Corps Trainee
PC/T	Peace Corps/Thailand; Peace Corps/Togo
PCV	Peace Corps Volunteer
PCVL	Peace Corps Volunteer Leader
PC/Y	Peace Corps/Yemen
PHC	Primary Health Care
PHI	Public Health Inspector (Sierra Leone)
PHS	Public Health Service (Sierra Leone)
PQLI	Physical Quality of Life Index
PRC	People's Republic of China
PSC	Personal Service Contract
PST	Pre-service Training
PUND	French version of UNDP--United Nations Development Program
PVC	Poly-vinyl chloride (plastic piping material)
PVO	Private Voluntary Organization
PWSD	Provincial Water Supply Division (Thailand)
RCD	Rural Community Development

R&D	Research and Development
RD	Rural Development
RDO	Rural Development Officer
RPCV	Returned Peace Corps Volunteer
RTG	Royal Thai Government
RWSD	Rural Water Supply Division (NRWSC, Thailand; Yemen)
RWSU	Rural Water Supply Unit, of MEP/RWSD (Sierra Leone)
SD	Sanitation Division, NRWSC (Thailand)
SEATO	South East Asia Treaty Organization
SENASA	National Service of Environmental Sanitation (Paraguay)
SORAD	Development Agency in Togo Government
SST	Stateside Training
TAC	Trainee Assignment Criteria
UNDP	United Nations Development Program
UNESCO	United Nations Educational, Scientific, and Cultural Organization
UN/FAO	United Nations Food and Agriculture Organization
UNICEF	United Nations International Children's Education Fund
USAID	United States Agency for International Development
WASH	Water and Sanitation for Health Project, USAID
WDS	Well Drilling Section, NRWSC (Thailand)
WHO	World Health Organization
WID	Women in Development
WSD	Water Supply Division, Division of MEP (Sierra Leone)
YARG	Yemen Arab Republic Government

Since 1961 when the Peace Corps was created, more than 80,000 U.S. citizens have served as Volunteers in developing countries, living and working among the people of the Third World as colleagues and co-workers. Today 6000 PCVs are involved in programs designed to help strengthen local capacity to address such fundamental concerns as food production, water supply, energy development, nutrition and health education and reforestation.

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